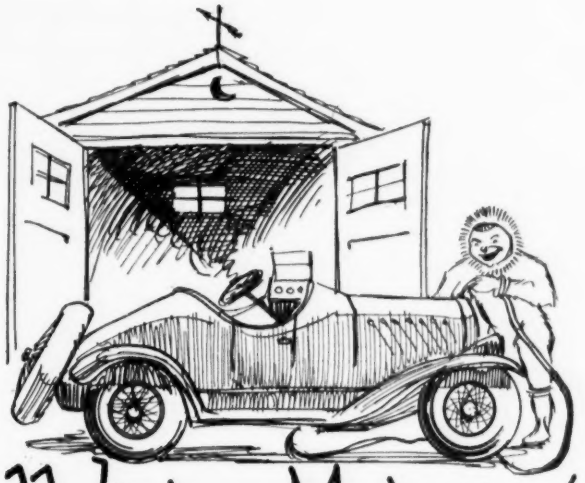
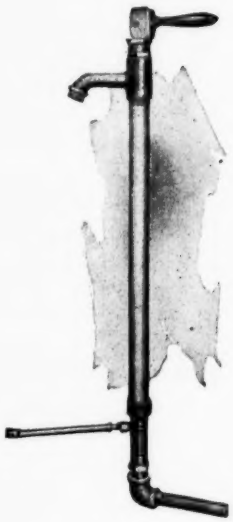


Winter Motoring



The hundreds of thousands of new cars being sold these days are to be used all winter—they will need hundreds of thousands of garages—both private and public and most of these garages will not be heated, and that's where the **VOGEL** Plumber shines.

You can install a **VOGEL** Hydrant or Closet in any unheated garage. It cannot freeze up no matter how far down the mercury goes.

You know the convenience of running water in a garage and so does your customers—Well, just get busy and tell your customers about the **VOGEL** Hydrant.

If you want business—here is a way to get it in bunches—see your jobber and then get busy.

Jovo—

Jos. A. Vogel Co.

Wilmington, Del. **St. Louis, Mo.**

VOGEL PATENTED

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Chicago, November 29, 1924

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ILLINOIS HEATING SYSTEMS

~MAKE WARM FRIENDS~

ASSURE COMFORT — AVOID TROUBLE

ILLINOIS HEAT RETAINOR

BROWNE PATENT

The third link in the chain of perfected units that make Illinois Heating Systems really super-efficient in operation, is the Heat Retainor.

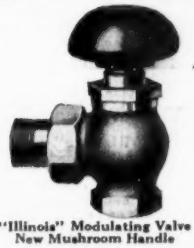
It operates on an entirely new principle, entirely different from other devices intended to eliminate the air from a heating system. It accomplishes this purpose in a manner that is unapproached in results by any other piece of apparatus or equipment.

Here is what it does: (1) Permits the free escape of air with but one-third of an ounce pressure. (2) Positively prevents the return of air by means of a water seal and a valve held to its seat by 19 lbs. pressure. (3) Slowly equalizes the pressure in the system and thus assists in returning condensation to the boiler.

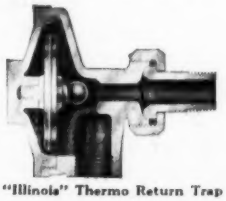
The Illinois Heat Retainor is as permanent a part of a heating installation as the boiler itself, and unlike other devices is unaffected by rust, scale or dirt—all air being water washed before it reaches the air-venting valve.

Give your trade the best, they will pay for it, get away from the dead level of general competition, figure something exclusive.

Let Us Tell You More About It.



"Illinois" Modulating Valve
New Mushroom Handle



"Illinois" Thermo Return Trap

"Illinois" Return Trap

REPRESENTATIVES IN 40 CITIES OF U.S.A.

ILLINOIS ENGINEERING COMPANY

ROBT. L. GIFFORD President INCORPORATED 1900

CHICAGO

Hajoca Lavatory Fittings Built to Last an Age

Something more than every sanitary convenience is obtained in Hajoca "Bryn Mawr" and "Villanova" Fittings. They stand up and resist wear as only Hajoca Brass Work can and for this reason are preferred for homes, apartments, hotels, hospitals and institutions.

With plumbers, these Hajoca Fittings have also found popular favor because their mechanical details have been carefully worked out to assist in an easy and quick installation and continued satisfactory operation.

All wearing parts, including stems, thread barrels and seats are removable and renewable; china parts are super-strong; nozzle is regularly furnished 3⅜" center to center. When specially ordered the nozzle can be obtained 4⅜"; the nickel surfaces bear a beautiful lustre.

Your jobber can supply these high grade Hajoca Lavatory Fittings at prices moderate enough to permit their use on competitive work.

Write us for booklet "Hajoca Brasswork for Modern Needs."

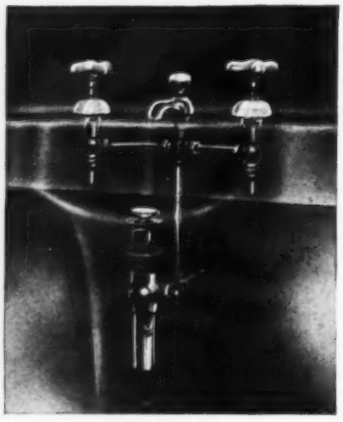


Plate W-728
(PATENT APP. FOR)

The "Bryn Mawr" Fitting

Hajoca "Bryn Mawr" nickel-plated top nozzle combination supply and pop-up waste fitting, for vitreous china or porcelain enameled lavatories, with compression supply valves with all china index handles and china base escutcheons.

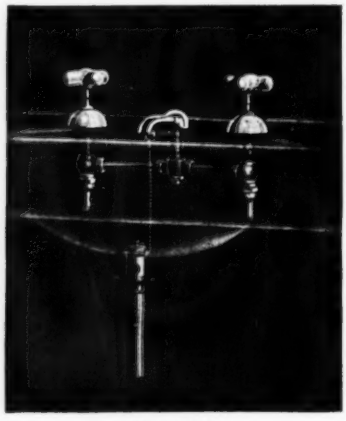


Plate W-734

The "Villanova" Fitting

Hajoca "Villanova" nickel-plated top nozzle combination supply fitting with waste plug, rubber stopper and chain, for vitreous china or porcelain enameled lavatories, with compression supply valves with all china index handles and china base escutcheons.

HAINES, JONES & CADBURY CO.
FOUNDED 1858
HAJOCA PLUMBING GOODS
GENERAL OFFICES, PHILADELPHIA, PA.
BRASS WORKS, PHILADELPHIA, PA. IRON WORKS, NORRISTOWN, PA.
PHILADELPHIA SAN FRANCISCO SAVANNAH RICHMOND, VA
JACKSONVILLE CHARLOTTE
NORRISTOWN, PA.

This is the fourth in a series illustrating the development of plumbing ideas.

Unmixed Waters

ROME'S water supply came from fourteen different sources. Water from the *Anio* aqueduct was used only for ornamental fountains and for flushing sewers; *Claudia* water for the Imperial table. Between these two, ranged the drinking and cooking waters and lower yet the soft but unsafe water, which served for cleansing operations.

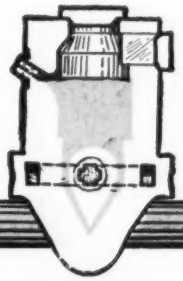
Convenience in some cases required the use of the same structure for carrying water from three different sources. Separate channels built one over the other were constructed to keep them apart as shown here, thus indicating an early recognition of the value of water analyses.

To-day water analyses further serve to foretell the probable life of household plumbing in the city served. Such analyses in the United States have shown that waters in the majority of American cities are destructive to steel pipe. On that account Plumrite Brass Pipe and Bridgeport Plumbing Supplies are used. They serve faithfully as long as the building itself whether in new construction or for replacement. Demand the uniformity that 100% electric furnace brass gives. This is found invariably in Bridgeport Brass.

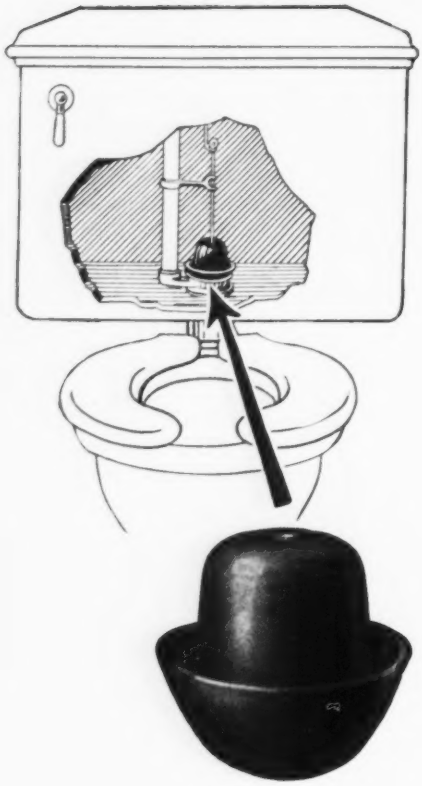
"Bridgeport"
BRASS TRADE CO. MARK
Plumbing Goods
WE MAKE
Ledrite Brass Rod
Phono-Electric Contact Wire
Plumrite Brass Pipe
Phono-Hi-Strength Wire
Tubular Plumbing Goods
Condenser Tubes - Sugar Tubes
Brass, Bronze and Copper Sheets
Brass, Bronze and Copper Tubes
Auto Bicycle and Pressure Pumps
Auto Accessories - Stampings
Engravers' Copper - Specialties
Screw Machine Products
Pressed or Drawn Products
Oil and Grease Guns

Bridgeport Brass Company
BRIDGEPORT - CONNECTICUT
NEW YORK PHILADELPHIA CHICAGO DETROIT

Electric Furnace Brass



Member Copper and Brass Research Association



Your Customers Know It!

GIVE your customers what they want—even though they do not actually ask for it. Whenever you install a new tank bulb, put in a Mushroom Parabal. Your customers have seen it advertised. It's the one repair article that they recognize, understand and expect you to use. All right, *give them the chance* to have it!

Not only do they know the Mushroom Parabal, but also the price—$1.25. That's the price they intend to pay. That is why you should bill it out as "1 Mushroom Parabal (Guaranteed 3 years) $1.25."

MUSHROOM

Parabal

Guaranteed 3 Years

The only one-piece tank bulb on the market. The only tank bulb made of pure, live gum. The only tank bulb nationally advertised. The distinctive mushroom shape, too, is a strong selling point because round and cone-shaped balls can be purchased in hardware, drug and department stores. But no mushroom-shaped balls are on sale there—only at Master Plumbers.

Use It On Every Job!

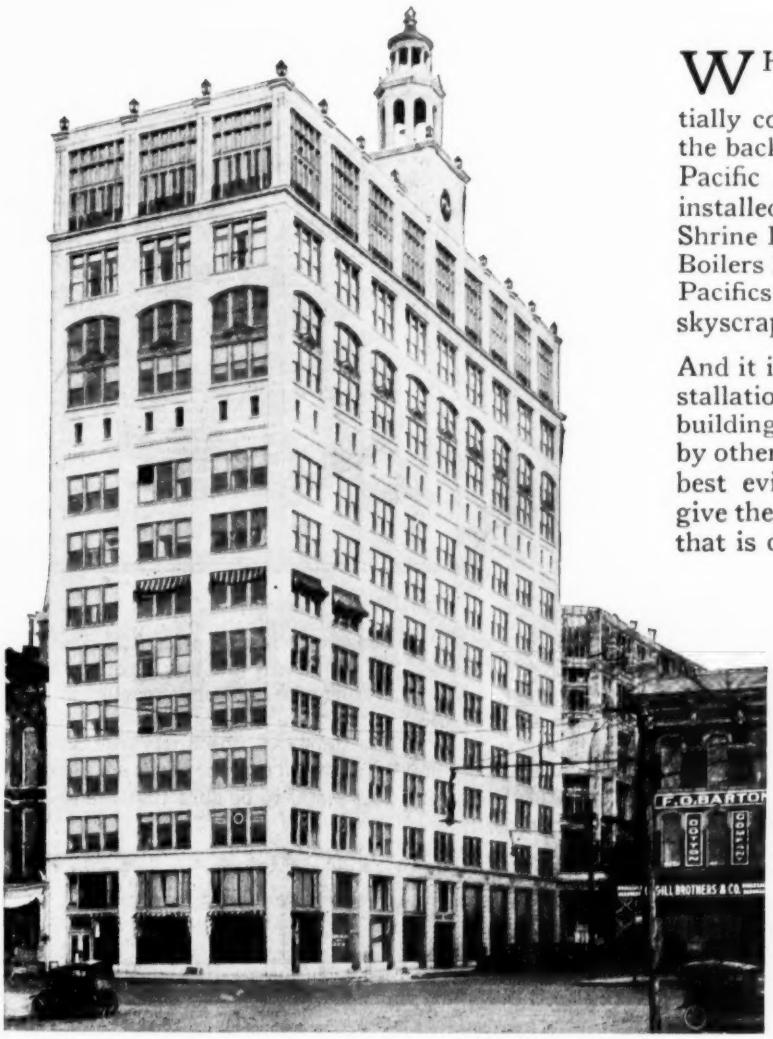
Cash in on this advertising. It's being done for you, a Master Plumber. Millions of people are told regularly that you alone sell this wonderful tank bulb. Give them the chance to have it by *using it on every job.*

Woodward Wanger Co.
Philadelphia
Quality Plumbing Specialties for 18 Years

Western Branch
922 Franklin St. OAKLAND, CAL.

Canadian Distributor
S. T. HADLEY 111 Anderson St.
MONTREAL, P. Q.

PACIFIC
STEEL HEATING BOILERS



WHEN the plans for the Lowenstein Building (the partially completed building shown in the background) were being drawn Pacific Boilers were specified and installed, for the operation of the Shrine Building's battery of Pacific Boilers had demonstrated how well Pacifics are adapted for heating skyscrapers.

And it is a notable fact that the installation of Pacific Boilers in one building is nearly always followed by others in nearby buildings — the best evidence that Pacific Boilers give the kind of heating satisfaction that is desired by building owners.

STEEL HEATING BOILERS · PACIFIC · WAUKEGAN ILLINOIS

Shrine Building, Memphis Tennessee. Hanker & Cairns, Architects — Jones & Furbringer Associates. T. H. Allen, Engineer. Three 10,000' Pacific Boilers installed by Fisher Heating Company.

General Boilers Company

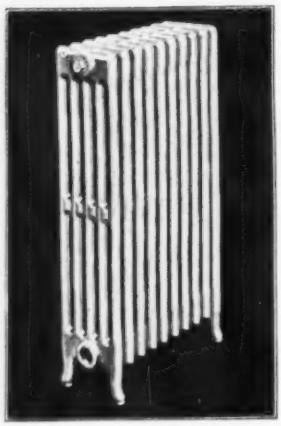
Manufacturers of

Pacific Steel Heating Boilers, Pacific Circulating Tanks

Waukegan, Illinois

An AMERICAN RADIATOR

THE STORY of American Radiators is one that every Heating Contractor knows. In every city and town they are making healthful warmth in homes. The world's largest and most famous buildings owe their comfort to American Radiators. They contribute no small part to the beauty of the buildings that they serve.

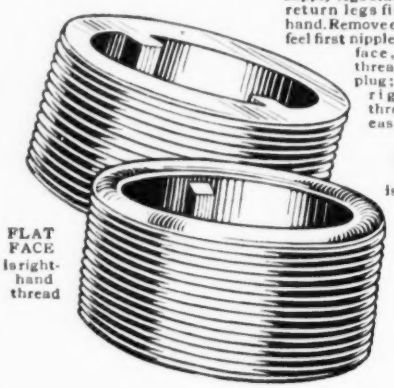


CORTO—
the Radiator Classic

Corto's beauty is undoubtedly the thing that makes home owners want it, but the thing that makes them glad they have it is its great efficiency. Corto not only saves one-third the floor space but does its work with only one-half the usual content of water or steam; circulation is faster and fuel is saved. Sell Corto and you gain substantial extra profit as well as a reputation for fine work.

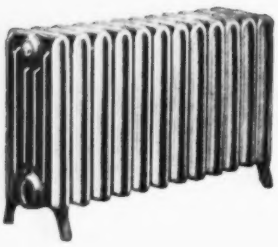
The first nipple tells

All nipples in an American Radiator are set alike—supply legs start left-hand; return legs finish right-hand. Remove end plug and feel first nipple; if rounded face, left-hand thread is toward plug; if flat face, right hand thread. Simple, easy, quick.

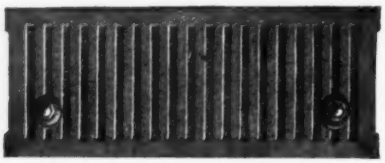


PEERLESS Column Radiator

THE exclusive Screw Nipple construction makes an American Radiator so strong, so rigid, so permanent that it is, in effect, a single perfect piece of cast iron. Wonderful automatic machinery, constantly gauged, does the most accurate facing, reaming and tapping; guiding nibs, plugs, and bushings are absolutely true. Interior surfaces are smooth and burrless; all exterior edges are filed smooth; legs are leveled on a steel plate, to be sure that the radiator does not "rock."



PEERLESS Window Radiator



PEERLESS Bathroom Radiator

AMERICAN RADIATOR COMPANY

IDEAL Boilers and AMERICAN Radiators for every heating need

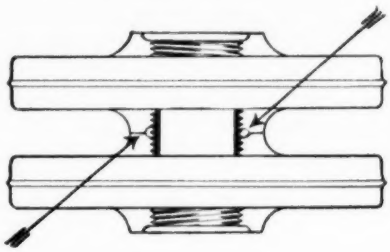
Dept. T-255, 1803 Elmwood Ave., Buffalo, N.Y. *Sales Offices in all principal cities*

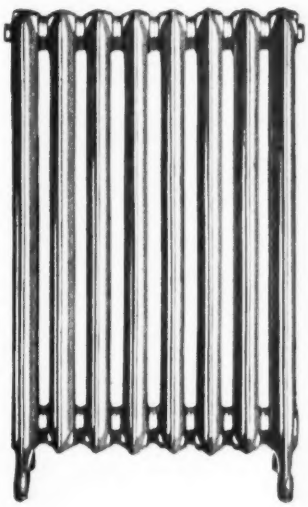
for every heating need

THIS MESSAGE is not to inform but simply to remind you that there is a particular design of American Radiator for every heating need. They are not only best and cheapest in the end but pay back far more than they cost when the owner wants to rent or sell—facts that our consistent national advertising has taught owner and builder alike to accept.

Joints permanently tight

American Radiators, unlike all others, are *screwed* together. Joints are tight, alignment is perfect; no unsightly tie rods. Sections are added or subtracted easily.

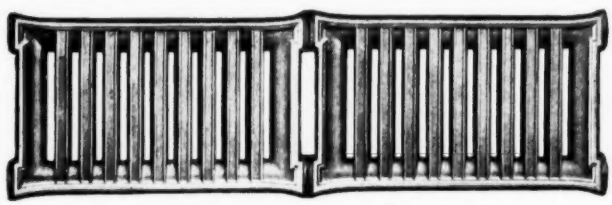




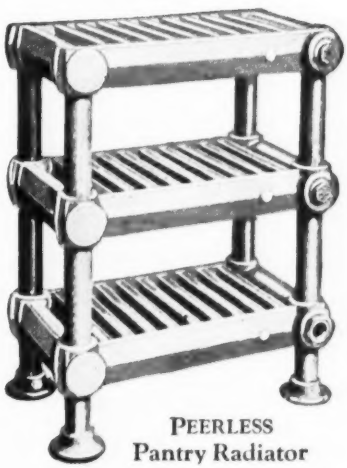
PEERLESS Hospital Radiator

Easy cleanability is the requirement for a hospital radiator. The special form of this variation from the Peerless Column Radiator, with the other designs pictured here, illustrates the solid facts behind our policy of having "an American Radiator for every heating need."

A HEAVY extra investment in machinery is required because of the mechanical refinements necessary in Screw Nipple Construction. These fine manufacturing facilities assure a quality product, standardized to fit every radiator requirement. With this obviously better radiator are a warehouse and shipping service that blankets the country, well-informed sales representatives, valuable catalogs and data, the most extensive advertising campaign—all helping you to sell IDEAL Radiator Warmth.



PEERLESS Wall Radiator

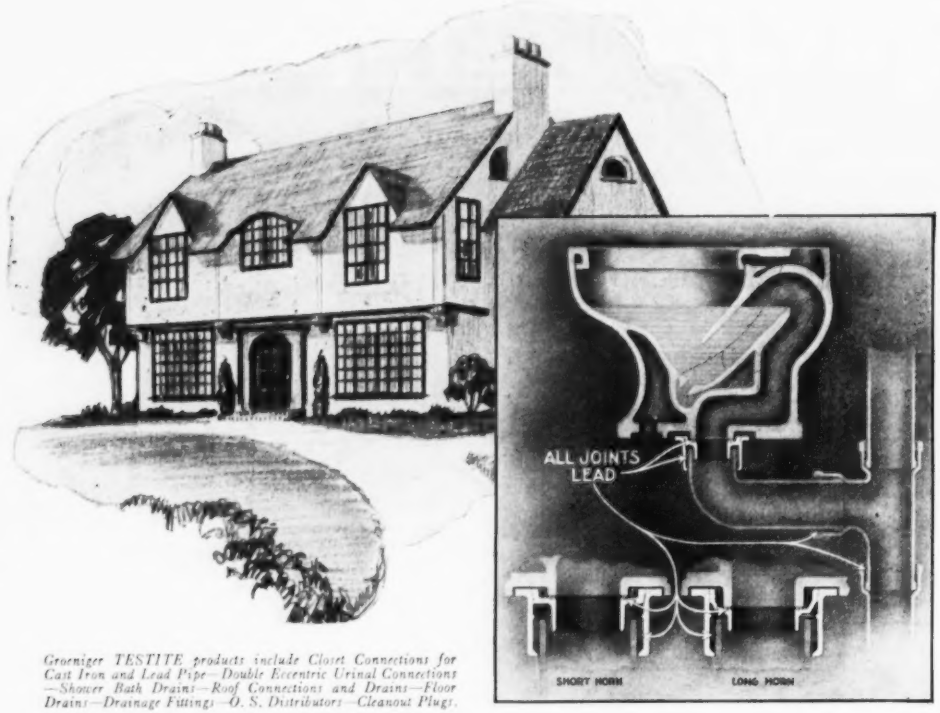


PEERLESS Pantry Radiator

AMERICAN RADIATOR COMPANY

IDEAL Boilers and AMERICAN Radiators for every heating need

Dept. T-255, 1803 Elmwood Ave., Buffalo, N.Y. *Sales Offices in all principal cities*



Groeniger TESTITE products include Closet Connections for Cast Iron and Lead Pipe—Double Eccentric Urinal Connections —Shower Bath Drains—Roof Connections and Drains—Floor Drains—Drainage Fittings—O. S. Distributors—Cleanout Plugs.

How to assure good plumbing *with* Groeniger TESTITE Connections

THERE IS AN ACHILLES HEEL — or rather, many of them—in every home, in connection with the plumbing. ¶ In the toilet, it is the joint between closet bowl and soil pipe. ¶ In the shower bath it adjoins the strainer opening in the floor—and also in the basement it may be the cleanouts or floor drains. ¶ The day of bad smells, putty, plaster of paris, leakage, cemented joints and the like, is OVER. ¶ Groeniger TESTITE Connections are made in every style to assure perfect joints everywhere. ¶ May we tell you more about them?

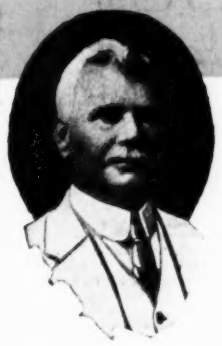
THE GROENIGER MANUFACTURING CO.
COLUMBUS, OHIO

See Our Catalogue
Domestic Engineering Catalog
Directory

TESTITE

Connections for Cast Iron, Screwed or Lead Pipes

Instantaneous Hot Water from a RANGE BOILER



ON THE twenty-fifth anniversary of the Dahlquist Mfg. Company, Mr. Theodore Dahlquist is pleased to offer the DAHLQUIST AQUATHERM COPPER RANGE BOILER to provide INSTANT HOT WATER as soon as fire is lighted.

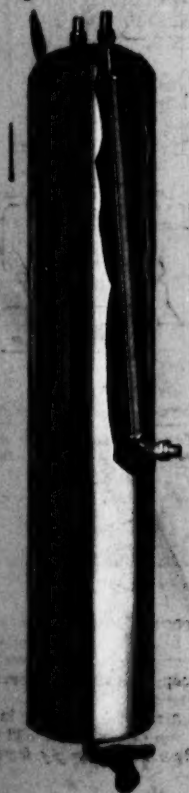
This is the first improvement in Range Boiler Construction in many years and will provide instant hot water to the Consumer at minimum cost and show a handsome profit to the plumbing contractor.

The Dahlquist Aquatherm Copper Range Boiler

will reduce by one-half the cost of installing a gas tank heater on any job and will provide the consumer with all the convenience of an instantaneous heater either from the ordinary gas tank heater, water back in coal range, indirect heater or coil in boiler or furnace or electric heater as the hot water is conducted direct from the heating source to the faucet. When the faucet is turned off the hot water is discharged through ports into the range boiler which immediately becomes a storage system, therefore you have three in one,—Range Boiler, Instantaneous Heater and Storage System.

The Dahlquist Aquatherm can also be furnished separately to be installed in any other range boiler now in use whether the water is to be heated by gas, coal, wood or electricity at a cost of *$10.00 list.*

The Dahlquist Aquatherm Copper Range Boiler and the Dahlquist Aquatherm itself are fully protected by patents in United States and Canada.

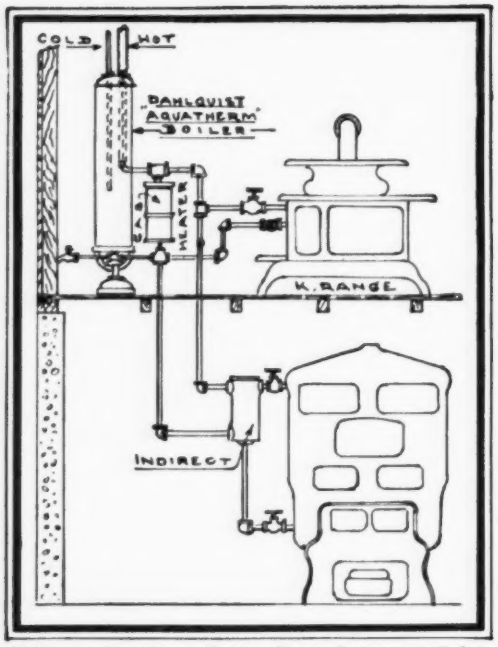


DAHLQUIST MFG. COMPANY

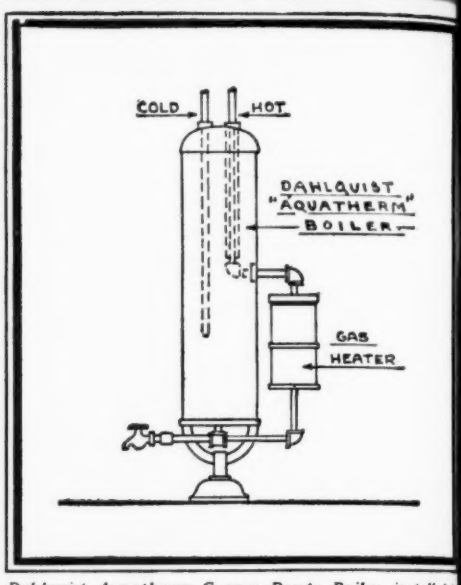
30 West 3rd Street • • **South Boston, Mass.**

Directions For Installing T
The Dahlquist Aquath

Cross section of Dahlquist Aquatherm Copper Range Boiler, showing Dahlquist Aquatherm installed.

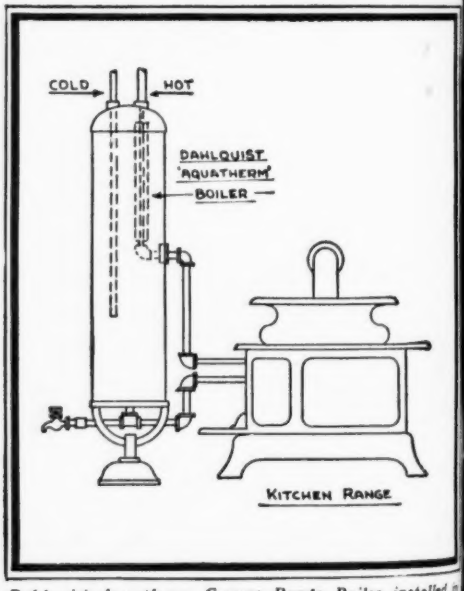


Dahlquist Aquatherm Copper Range Boiler installed in connection with gas tank water heater, water back in coal or wood kitchen range in kitchen, and indirect water heater in cellar.



Dahlquist Aquatherm Copper Range Boiler installed in connection with gas tank water heater in kitchen (no the simplicity and neat appearance of installation).

Although the Dahlquist Aquatherm is very simple, its effect is wonderful. It is a device that has long been needed.

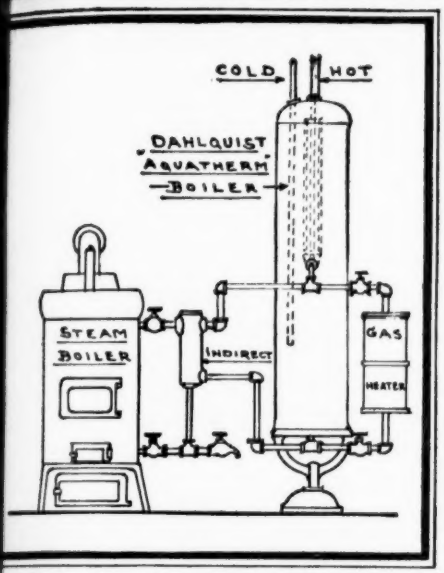


Dahlquist Aquatherm Copper Range Boiler installed in connection with water back in coal or wood kitchen range

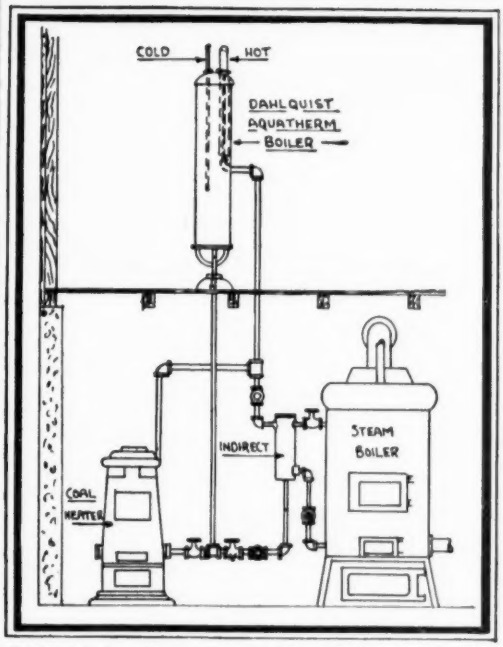
The Dahlquist Aquatherm Copper Range Boiler can be furnished in any size desired, and the Dahlquist Aquatherm can be furnished in the proper size for any range boiler now installed. It is made entirely of brass and copper, so it will not rust or corrode.

To install the Aquatherm in a range boiler now in use, remove the hot water connection on top of the boiler and the side connection which is to be the hot water supply from the boiler

Dahlquist Aquatherm Or Copper Range Boiler



Dahlquist Aquatherm Copper Range Boiler installed in cellar in connection with gas tank water heater and indirect water heater in cellar.



Dahlquist Aquatherm Copper Range Boiler installed in kitchen in connection with indirect water heater and coal fired water heater in cellar.

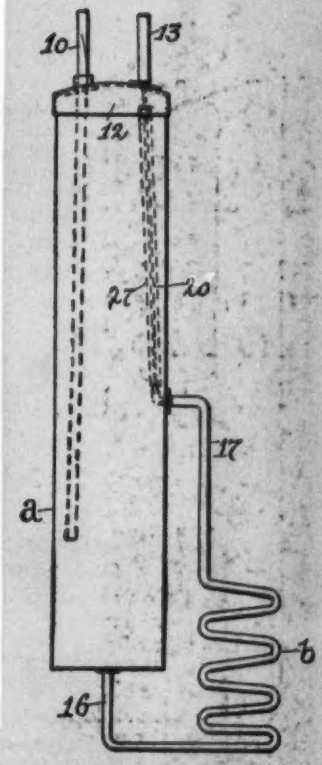
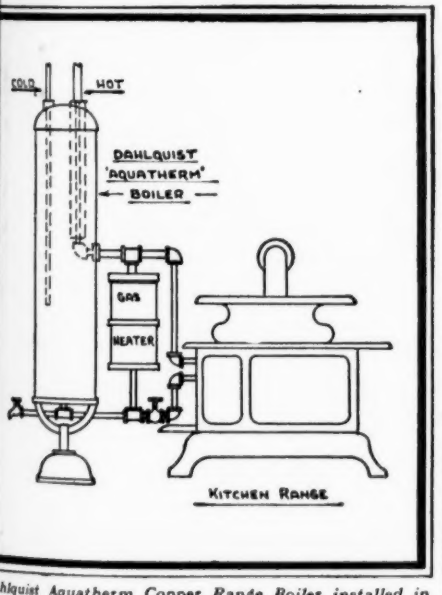


Fig. 1
Cross section drawing of Dahlquist Aquatherm Copper Range Boiler showing Dahlquist Aquatherm installed.



Dahlquist Aquatherm Copper Range Boiler installed in connection with gas tank water heater and water back in coal or wood kitchen range (note the saving of pipe, fittings and labor).

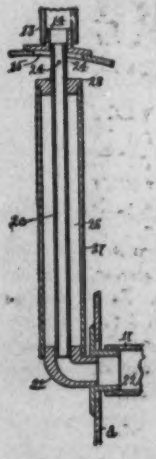



Fig. 2
Cross section detail drawing of Dahlquist Aquatherm.

Don't just install a "Range Boiler" when you can buy the Dahlquist Aquatherm Copper Range Boiler with its many features.

Insert the long part of the Aquatherm from the top and the short part from the side, the two being put together with a screwed joint.

Each Aquatherm is insulated with a shell containing dead air space, so that no heat is lost by the water in passing directly to the faucet.

DAHLQUIST MFG. CO. 30 W. Third St. SO. BOSTON, MASS.

Dahlquist's Copper Range Boilers

Heavily reinforced with brass rings, tops riveted; on the 250 and 300-pound pressure boilers, both ends are riveted. In all direct pressure boilers of above 80-gallon capacity a handhole is placed in the bottom.

Made in capacities from 5 to 500 gallons and in three pressures tested respectively to 200, 250 and 300 pounds. Stock range boilers are made in various pressures up to 250 pounds and to order up to 300 pounds. Working pressure complies with the Massachusetts plumbing regulations.

Capacity .....Gal.	30	40	50	60	70	80	90	100	125	150	200	250	300	350	400
Diameter .....In.	12	14	16	17	18	20	20	20	22	25	30	32	35	35	35
Length .....Ft.	5	5	5	5	5	5	5½	6	6	6	6	6	6	7	8

For buildings requiring a constant supply of hot water, heavy pressure boilers made in varying capacities from 100 to 3,000 gallons. The latter requiring frequently a working pressure of 200 pounds. Can be supplied with or without coils.

Dahlquist's Copper Tank Pressure Boilers

Made of best quality lake copper, in capacities from 25 to 300 gallons, standing a pressure of about 25 pounds. Stock sizes run up to 100 gallons capacity.

When ordering, state what couplings are required. Extra charge for large connections.

Dahlquist's Copper Heavy Pressure 800-Gallon Boilers

Size 9 feet 6 inches long and 4 feet in diameter. Made of heavy copper, reinforced and riveted, for use where a boiler for heavy pressure is required.

Dahlquist's Copper Steam Jacket Kettles

Made with extra heavy copper bottoms, on wrought iron legs. Range in capacities from 3 to 200 gallons; in diameter from 13 to 45 inches; and depth from 8 to 39 inches.

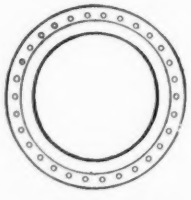
Cap. Gal.	Diam. In.	Depth In.
3	13	8
4	14	9
5	14	11
6	15	11½
7	15	13
8	16	13
9	17	13
10	17	14
12	17	16
15	19	16
18	20	18
20	22	18
25	24	18
30	25	20
35	28	18
40	30	19½
50	32	20
60	33	24
75	35	24
100	38	28
125	40	30
150	40	36
200	45	39

Dahlquist's Copper Pressure Barber Boilers

Cap. Gal.	Diam. In.	Height In.
5	10	13
6	10	16
7	10	20
8	12	16
9	12	18
10	12	20
11	12	22
12	12	24
15	12	30
18	12	36
20	12	40

The strain caused by the direct pressure and expansion which invariably takes place under the great demand in barber shops for hot water makes the use of a good boiler necessary. This boiler has been built for such an exacting demand.

Dahlquist's Corrugated Copper Expansion Joints

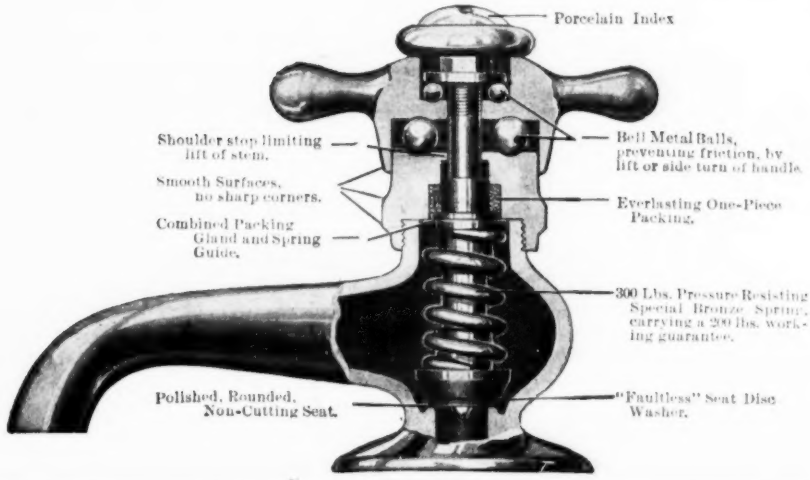


The Dahlquist expansion joints are made of the finest quality lake copper. The deep corrugations afford the elasticity and strength necessary to withstand constant changes due to fluctuating pressures.

The joints are made in 3 corrugations. They are simple in construction, built for durability; and are safe, compact and efficient.

Dahlquist corrugated copper expansion joints can be made in any size required, or to meet engineers' specifications.

When ordering, size of pipe, working pressure, amount of expansion required, and whether pipe conveys air, steam, water or gas should be given.


Porcelain Index
Shoulder stop limiting lift of stem.
Smooth Surfaces, no sharp corners.
Combined Packing Gland and Spring Guide.
Polished, Rounded, Non-Cutting Seat.
Bell Metal Balls, preventing friction, by lift or side turn of handle.
Everlasting One-Piece Packing.
300 Lbs. Pressure Resisting Special Bronze Spring, carrying a 200 lbs. working guarantee.
"Faultless" Seat Disc Washer.

3 Balls, 2 Balls and 10 Balls

"THREE BALLS" has long been associated with cheap merchandise of doubtful origin. In ball-bearing, self-closing basin cocks, two balls is the mark of such merchandise. Ten balls is the distinguishing feature of a Ryco unit.

Two balls will make a ball-bearing basin cock that will work, but the eight additional balls in the upper race of the Ryco unit steady the stem, keeping it absolutely in line and still further reducing friction.

In addition to this big advantage, the Ryco units have many other special features—such as renewable seat and interchangeable index—which fit them for use wherever high quality is essential.

THE "Faultless" trademark covers a complete line of HIGH-GRADE plumbers' brass goods. Among the leading specialties are:

RYCO Ball-Bearing Self-Closing Basin Cocks, Bibbs, Stops, Etc.

AQUA Self-Closing Lever-Handle Basin Cocks, Bibbs, Stops, Etc.

RYCO Ball-Bearing Self-Closing Drinking Fountain and Ice Water Faucet.

QUIC-FLO Water-Tempering Faucets for Kitchen Sinks, Quick-Compression, Double Basin Cocks, Quick-Compression Double Basin and Shampoo Cocks, Etc.

You Can't Make a Mistake on a Ryan Fixture

1883—J. J. Ryan & Company—*1924*

Monroe and Jefferson Streets, Chicago, Illinois

The LAST WORD in Pipe Cleaners!

IMPROVED DESOLVO

We have reduced the fumes 90% or more and yet we have retained the same heat as before. Improved Desolvo will create an intense, boiling solution which will dissolve vegetable or organic matter and ice, quickly and quietly and no fuss—no muss. Once used your trade will come back for more. An absolute necessity with an unlimited market.

Attractive display container for your counter will get you orders!

The CHAMBERLAIN COMPANY Terminal Way Pittsburgh, Pa.

Chamberlain Desolvo Co., Ltd.
30 Church Street Toronto, Ontario

SUPPORTING T&B MEMBER

Between Ourselves

The man who is so busy that he does not have time to read his trade paper is like the man who was so busy chopping wood that he did not have time to sharpen his axe

YOUR WEEKLY MUST NECESSARILY serve the wants of all kinds of men. Some of you expect a large quantity of reading material each week, for you read at high speed. There are others who read more slowly, and these spend more time in picking out their articles. So we must provide enough information for the heavy reader, and a large enough assortment to suit the "choosy" reader.

I found just one answer—to furnish more articles and more news. And the November 22 issue is an example of the "Domestic Engineering" that contains even more information of the highest quality we can secure. While the number of reading pages will probably vary from week to week, I plan to give you in every issue just as much sound, practical material as can be squeezed in between the covers. If you like the idea, it costs only 2 cents and five minutes' time to let me know it. So drop me a line, won't you?

SOMEONE HAS SUGGESTED THAT READers like to know what is discussed in each issue before reading anything. In other words, he thought this page should contain brief descriptions of this issue's contents. Perhaps that isn't a bad idea, either. Titles don't always indicate clearly what is found in the story, any more than words on a bill of fare tell definitely what will be served to you. At any rate, I'll try the plan and await your opinion on it.

You know of the interest that has been developing in regard to oil burners. Every day, and in increasing quantities, letters come to this office on that subject. Especially has this been true since the appearance of articles on the selling and servicing of oil burners. Today W. T. Dean, whose first discussion appeared in the Oct. 11 issue, offers a second article on "Oil-Burner Essentials." This is written from a technical rather than merchandising viewpoint. But the man who knows little of the technical points of oil burners has forgotten a vital part of his training for handling oil burners. So read this discussion, and be prepared on the technical end of this work.

THE SECOND INSTALMENT OF JOHN Reinartz' "Competition, Overhead, and Profit," is well worth your attention. Perhaps you think that this series is slow in reaching any definite conclusions. But, as Mr. Reinartz says, if the problems are not examined and discussed in detail, the reasons for the conclusions would not be clear. He is analyzing the basic reasons for a man's success in the plumbing and heating field, and I think you will be the gainer if you read his ideas and think about them. Neither these or any other articles are offered as being the first and last word on the subjects they discuss. Some are valuable just because they make you do a little thinking for yourself. And thinking never hurt anyone, did it?

YOUR FRIEND THE SCHOOLMASTER, OR R. M. Starbuck, has a vital offering on the determination of soil and waste pipe sizes. Not that a vital discussion is unusual from him; most of his contributions should prove extremely valuable to you. But he has gone into a subject that has received little attention and could stand considerable thought and action. If you try to be informed on live topics, see what Mr. Starbuck has to say this week.

And now you have a new series on short-course instruction—the facts on the Carnegie Institute of Technology Short Course. The article in this issue does not get down to the technical material, but probably the following issue will tell of some of the work done for the classes of ambitious Pennsylvanians. More than that, our reporter brought back a group of fine photographs which show clearly the plumbing, heating and ventilating experimental equipment. These pictures will be used with the articles from week to week.

THE SERIES ON PLUMBING-SYSTEM pressures is completed in glorious fashion several pages to your right. "Glorious," I say, because it presents the "Twenty Conclusions" brought out as a result of experiments at the University of Illinois Short Course. You will want to know these conclusions, for they bear directly upon the work you are doing every day. If you haven't followed this series, it's your loss. But at least benefit by the "Twenty Conclusions." You don't even have to read through the article to find these conclusions. They occupy a full page by themselves, and they're worth all the space they occupy to you and your progress.

Your Editor

THE "TOLEDO" RATCHET BORING TOOL IS A REAL TIME AND LABOR SAVING DEVICE

It will bore holes through joists or other parallel timbers and takes the place of a saw, or mallet and chisel, which has heretofore been necessary in connection with piping jobs.

It uses an adjustable expansion bit having a capacity of smoothly bored holes from 1¼ to 2½ inches in diameter, thus providing for the small size pipe of a plumbing installation, as well as the larger size pipe used in the heating job.

It is adjustable for use between joists spaced at different widths, and after being placed in position, feeds itself. The operator merely works the ratchet back and forth until the hole is bored.

A few strokes of the ratchet and the hole is bored

Ask your dealer to show it to you, or write your name and address below and mail same to us for full information and net prices.

Show me how I can save with a "Toledo" Ratchet Boring Tool.

Name .....

Street .....

City .....

State .....

D. E.

THE TOLEDO PIPE THREADING MACHINE CO. TOLEDO, OHIO

New York Office: 50 Church Street

Domestic Engineering

Vol. 109, No. 9
Whole No. 1668

Chicago, Illinois
November 20, 1924

The Plumbing and Heating Weekly

Which Will Help Most?

AT a recent gathering of plumbing and heating contractors a "Domestic Engineering" representative was asking opinions on the articles in this business paper. Quite a number were unable to comment. Although the paper came to them every week, they had not been noticing the articles or reading them.

"We don't have time," was the explanation. "We're busy all day. At night we read the local newspaper after dinner, and then the wife usually wants to go to a movie. So there's no chance to read it, you see."

It's simply a question of values. Of course you like to read the newspaper; every normal person does. And not many of us object to taking in the movies once a week or so. But let's face the facts. How important are your newspaper and movie as compared with a magazine whose one and only purpose is to make you more successful in business?

If you are in dead earnest about making money in plumbing and heating, you'll find time to read "Domestic Engineering." You'll set aside certain hours over the week-end for getting information that equips you to serve your customers better. You'll give first attention to the reading that helps you most. And if your wife sincerely wants you to earn more profit, which will bring her more of the pleasures of life, she will help you make this effort to cash in on the contents of Your Weekly. Read this editorial aloud to her, and see what she says.

Push the Septic Tank

PERHAPS you have been out to the man on the farm, putting over the idea of heating and plumbing for his place. What was the first objection he raised? Nine times out of ten he will say, "But how can I dispose of the waste?" And there you are. He can't—unless he instals a septic tank.

The alert plumbing and heating man who has had this experience is now selling septic tanks. He has not been slow to realize that without a means of waste disposal he hasn't a chance of selling fixtures or services. More than that, he doesn't forget that opportunities for septic tank sales are found in towns and cities of every size. The outlying residences—whether in a town of a thousand or in Chicago or New York—usually have no sewer system. And so the master plumber who is up on his toes sells septic tanks to the suburbanite as well as to the farmer. And then he follows up by selling plumbing and heating equipment to the same customers.

Are you this alert plumbing and heating man? If not, you are missing a real bet. Why not take this business that less progressive men in your field are ignoring? One of these days a competitor may jump ahead of you and gather in this trade. If he is smart enough to sell a product that is needed—such as the septic tank—he deserves to get this profit. But go after this business now, and beat him to it. The man who trails behind, you know, gets only what the leader doesn't want.

Moving Forward

FAR-SIGHTED men of the plumbing and heating industries have felt concern at the shortage of apprentices. A number of these men have not stopped with thinking about it; they have taken definite steps to help create such a supply of apprentices as shall enable plumbing and heating contractors to guarantee good work and good service by good journeymen. The National Association of Master Plumbers as a group is working upon the problem. And another leader—as it should be—in this apprenticeship drive is the National Trade Extension Bureau. Its past work, under the able direction of E. L. Bowman, need not be described here.

But now the Bureau has moved forward another step, by the adoption of its correspondence training plan for apprentices. The motto, "An Apprentice in Every Shop, and Every Apprentice in School!" is being actually applied by the Bureau.

Do you, Mr. Average Master, want to be respected as is the banker or the clothier? One of the surest ways to win that respect is to put one or more apprentices into your store. The next step, proving you a far-sighted business man, is to place your one or more apprentices in the T. E. B. correspondence training school. You couldn't show more plainly your good judgment. The school work will broaden your boys' viewpoint; it will develop their ambition; it will lead to greater interest in their daily work for you. For the sake of your own progress, get behind this plan and put it to work.

ASSOCIATION LEADERS

O. C. Robertson

WICHITA, KANSAS

President, Kansas Master Plumbers' Association

Competition, Overhead *and* Profit

By JOHN REINARTZ
New York City

Part II

Who are the college students? Merely boys and girls whose fathers know how to meet competition, to know overhead, and to be sure of profit

ANOTHER item to be spoken of concerning the cost of labor is payment for lost time. Sometimes the contractor cannot avoid payment for fitters' time on which he has received no return, as, for instance, when their work is held up because the carpenter work is not sufficiently advanced. Payments for lost time, caused by such circumstances as these, should be charged against this job. However, this is more or less only a transaction in the books; for the amount to be paid for the job is already fixed, and the payments for lost time are not large enough to justify legal action.

Payments for lost time caused by inefficiency in management should not be charged to overhead expenses. In my opinion such payments should be accounted for as losses. In a plumbing and heating firm which does mostly repair work the amount to be paid for lost time is generally greater than in a business which does mostly new work. Many owners of such businesses would be surprised to know to what amounts the payments for lost time will run. Therefore, I would advise a special account for payments of this nature, so that the totals can be studied. To know exactly how much money is lost by payments for lost time will lead you to find ways of reducing them.

CONSIDER THE OVERHEAD

MATERIAL and labor costs have not such an important bearing on competitive price-setting as have overhead expenses. But we cannot make overhead expenses disappear; therefore, we shall give them careful consideration. In the following discussion overhead expenses are treated chiefly in their bearing on competitive price-making.

Aside from the fact that it is impossible to determine accurately just what part of "running expenses" are caused by a given job or contract, the amount itself varies to a great extent between different plumbing and heating establishments. One contractor pays $80 rent, the other $40; one pays $800 monthly in salaries, the other $400, and so on. Furthermore, business is a living matter, involving living persons; and every person has different needs and different expenses. So it is clear that the amount of O. H. E. included in a certain job by one firm usually differs from the amount included by another firm on the same job. The difference becomes greater, of course, when errors are made in ascertaining the amount of overhead expenses.

Another important factor of competitive price-setting is the fact that overhead expenses do not increase in the same proportion as does the volume of business. A plumbing and heating firm which, we will say, averages six estimates a week and gets four jobs a week, would be able to contract for five or six jobs a week without substantially increasing the expense of doing business. The firm pays the same rent, no matter whether four, five, or six contracts are secured. It would not be necessary to employ more office help; and so on.

Of course, a small firm, we will say a one-man business, will face an increase of overhead expenses in nearly the same proportion as the increase in volume of business. However, the fact that overhead expenses do not increase exactly proportionally to the increase in the volume of business causes—even when this fact is not turned to account systematically—a difference in the prices, provided that the percentage method is applied to distribute overhead expenses to the different jobs. Let us assume that in two plumbing and heating firms each pays the same amount as overhead. But if the one is more successful in getting contracts than the other, the "lucky" man in the coming year has a lower percentage of overhead expense than the man who had not so much success. Through that lower percentage the "luck," other things

being equal, probably will stay in the coming year with the same contractor as in the past year.

ERRORS IN ESTIMATES

I HAVE mentioned that errors made in figuring the amount of overhead expenses are responsible in a large degree for losing jobs, on account of the high prices. This matter is important enough to analyze more fully. I have seen many overhead-expense schedules from plumbing and heating firms, but seldom one which showed the proper amount. In some cases the amount for overhead was 20 to 40 per cent too high. If the overhead expenses are too high, no wonder one loses a job; but do not think that competition cut the prices. The man who lost the job is at fault. Of course, too, a man sometimes does not count all the items which belong in overhead, and then the amount is too low. Errors which cause too-high overhead expenses are chiefly made in ascertaining the overhead from the general books.

Not all expenses in the ordinary sense are expenses in a business sense. The general books serve as a basis for figuring taxes to be paid the government. But the government does not draw such a line of demarkation, at least not in such a narrow sense as the business man does. Partly for that reason the difference between expenses in the usual sense and expenses in a business sense disappears often in the general books. In that way the accumulation of "sleeping" reserves of this kind causes a high amount of overhead expenses.

Another reason for the same effect is the fact that many plumbing and heating contractors do not employ bookkeepers who distinguish between expenses in the accepted sense and expenses in a business sense, not to speak of "productive" expenses. I will use an example which may serve as illustration of the foregoing discussion.

AN EXAMPLE

LET us assume that a plumbing and heating firm buys a truck costing $600. It is estimated that the firm will get about six years of service out of the machine, so it adds $100 a year to the overhead in place of depreciation. (For the sake of simplicity I will not mention the scrap value.) After three years the truck will have a book or inventory value of $300. But in the third year the firm spends $200 for overhauling the truck, and then the truck is good for five more years. In this case the book or inventory value of the truck has to be increased from $300 to $500.

In many cases expenses of this kind are charged to overhead, and by that the amount of overhead expenses becomes higher than necessary. Expenditures of this nature have nothing to do with overhead expenses, and the competitive system does not allow us to treat them as overhead expenses.

Another kind of expenses or, rather, losses, which must be dealt with in a special way, are those caused by failure of one or more customers. If a plumbing and heating contractor loses $1,000 through the failure of customers, it is bad. But it would be worse if the contractor in this case charged the overhead-expense account with $1,000. The competitor may have no loss of this kind, or only a few dollars. In other words, the $1,000 charged to overhead expense-account undoubtedly will be an obstacle to gaining future profits.

Furthermore, to face losses of this character is a part of the risks concerned in doing business. Every business man must assume risks; and as long as competition is going on it will always be so. Therefore, shrewdness in meeting risks is an element of success. The plumbing and heating contractor must overcome the risks, or at least be prepared to meet the bad effects of a loss of this nature. While you may lose $1,000 through failure of one or more customers, your competitor perhaps does not lose a cent. And so if you charge the $1,000 to overhead expense, your estimates probably will be much higher than those of your competitor.

BAD ACCOUNTS

BAD accounts must be dealt with in another way. If you could, probably you would carry insurance against the risk of bad accounts, just as you insure your building or your life. But there is no company undertaking this kind of business.

Therefore, be the insurance company yourself. Lay aside every month a certain amount as premium to a "getting-on" account provided for this purpose. In time the amount of the premiums will total, we will say, $1,000. The premiums paid to this account are to be subtracted from the gross profit made on every job. Should you incur a loss through failure of a customer, you will have a sum at hand to offset the bad effects of such an accident. Otherwise you might go to the wall on account of the failure of others. If you are careful you may have no loss of this kind. In this case the $1,000 becomes profit at the end of the year.

But if you do not want to take a chance, do not look upon this accumulated $1,000 as money that can be spent freely. However, I will return to this subject later on, in showing how to conduct a plumbing and heating business on a safe basis by applying methods which enable you to meet competition on an intelligent basis.

Another item not belonging to overhead expenses is the part of the interest over 3 or 4 per cent that is paid for borrowed capital. The man who borrows all or a part of his capital cannot charge 6 or 7 per cent to overhead, when he pays that for interest. Interest on borrowed capital is like a division of profits; therefore it should be deducted from profit. The lender of the money is like a partner.

Furthermore, it is an open question whether interest on working capital is to be included in the cost at all. By "working capital" is meant the part of the capital which is used for buying material, etc., while "invested capital" means the amount of capital tied up in tools, equipment, etc. Of course interest on invested capital is a cost item; but as regards interest on working capital there are differences in opinion. If we consider that the working capital is turned over perhaps ten times a year, the rate of interest to be included in a certain job is reduced in such a degree that it has no importance at all. For that reason it is not advisable, in case the capital is borrowed, to charge to overhead more than 3 per cent.

INTEREST TO BE SUBTRACTED

OF course, when I want to determine my total profit at the end of the year, I have to subtract the interest of the invested capital and of the working capital as well, because the interest of the capital it not due to my activity in business. When I work for somebody else and put my money in the bank, I get the interest on my money besides the salary from my employer. On the other hand, if I am in business and the profit made does not exceed the interest which I would have received if my money was in the bank, I might better give up the business and take a salaried position.

A number of other expenses should not be included in the cost if competition is to be met, as they are due to poor management and unwise business policies. In showing, later on, how to conduct a plumbing and heat-

Watching the bank account grow gives one a peculiar sort of pleasure. But that pleasure is not for the master who guesses at overhead expenses or forgets to include a profit

ing business on a safe basis, I will find opportunity to mention a few of them. I have observed the variation of expenses between competing plumbing and heating establishments.

Anyone can puzzle over the great variation of expenses in different enterprises of the same type; but a thorough study shows that this variation is caused by the differences in the men operating each enterprise.

You may have a cost-keeping system, or you may not. But, anyhow, on what do you put the blame for all expenses and losses? On the fitter, on the customer, on the stenographer, on the competitors, on business conditions, or on yourself? Does your accounting system show losses and expenses due to improper business policies? These are a more common source of expenses and losses than anything else. Do you know how many, if any of your expenses are due to poor management? If not, your cost-accounting system does not help you in meeting competition. It will be more of an obstacle than anything else.

Many plumbing and heating contractors seem to go ahead more successfully when trusting to their common sense than when guided by the figures of their expense accounts. This appearance is not surprising. Many cost-accounting methods show figures which cannot be used as a basis for fixing sales prices, although all expenses were accounted for. Unwise business policies result in high expenses and inefficiency. In a heating and plumbing business directed by a wise policy the expenses are lower than in a business directed by an unwise policy. For that reason cost systems which do not show the expenses due to unwise management cannot be used as a basis for fixing the sales prices.

A simple way to install such a system is as follows:

WISE OR UNWISE?

LOOK on your expenses of the last months, and ask yourself which of them could have been avoided. The expenses of the coming month must be treated in the same way. Mark the expenses which could have been avoided. In doing so, you are made better aware of your mistakes, and these experiences will guide you more safely than could the figures of any cost system. I will return to this method of treating expenses in another article.

It is essential to know the underlying causes before conclusions can be drawn. In order to make our conclusions better understood we will first compare competition in the retail plumbing and heating industries with competition in the manufacturing end of those industries.

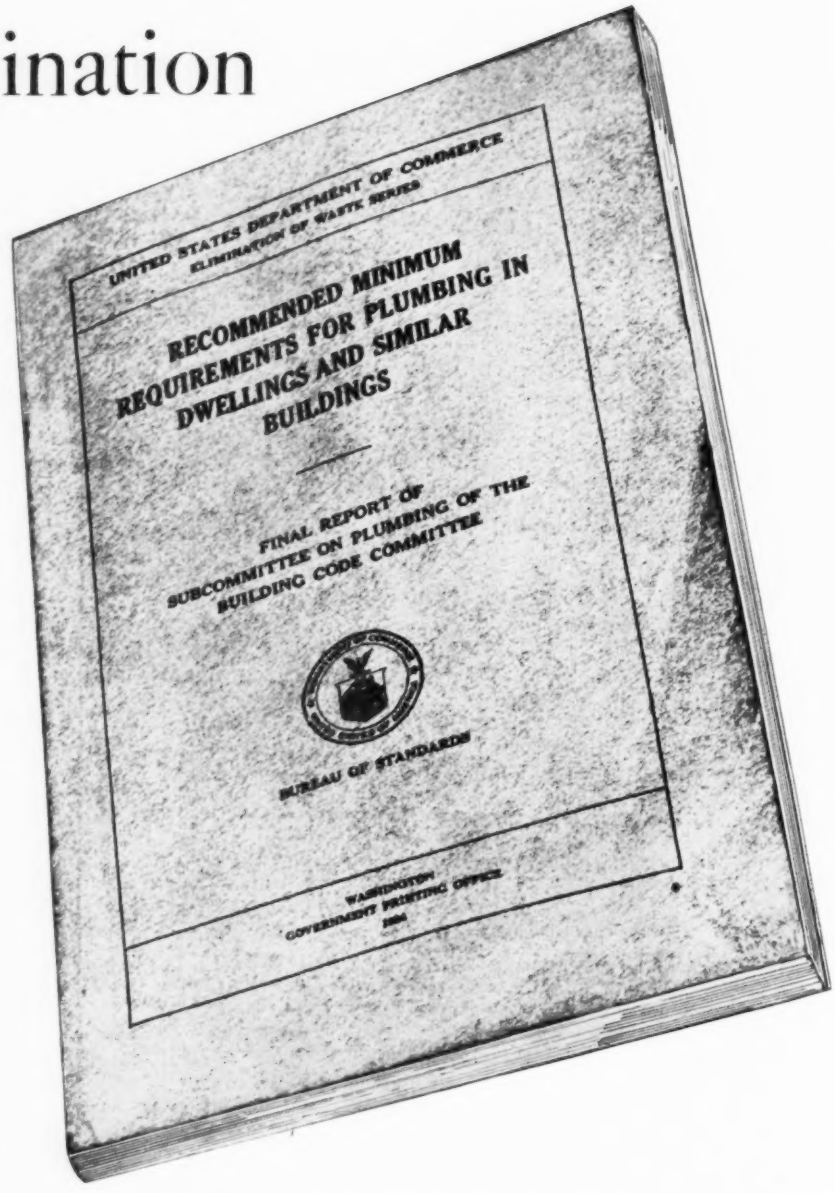
While competition among plumbing and heating contractors is a somewhat complicated affair, competition in the manufacturing field of plumbing and heating goods

(Continued on Page 30)

Determination *of* Soil *and* Waste Pipe Sizes

An answer based on the Department of Commerce report on Plumbing Requirements, as ably interpreted by

R. M. STARBUCK


UNITED STATES DEPARTMENT OF COMMERCE
ELIMINATION OF WASTE SERIES
RECOMMENDED MINIMUM REQUIREMENTS FOR PLUMBING IN DWELLINGS AND SIMILAR BUILDINGS
FINAL REPORT OF SUBCOMMITTEE ON PLUMBING OF THE BUILDING CODE COMMITTEE
BUREAU OF STANDARDS
WASHINGTON
GOVERNMENT PRINTING OFFICE
1924

THOSE who have been following our articles for the last four or five months, will have noted the fact that we have constantly referred to various recommendations contained in the government report on plumbing requirements issued last Spring by the Department of Commerce, under the authority of Secretary Herbert Hoover.

We are again going to base the work of this article on recommendations contained in this splendid report, and have chosen for our subject "The Determination of Soil and Waste Pipe Sizes."

You may wonder just why we constantly make reference to this report, and once more we will tell you why,—it is because the report gives 260 pages "chuck-full" of common-sense plumbing knowledge, information that ought to be under the hat of every wide-awake member of the plumbing fraternity, including plumbing inspectors especially.

And once more we tell you that you can for 35 cents become the possessor of this report, by writing to the Superintendent of Documents, Government Printing Office, Washington, D. C., for the report on "Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings."

Contained in the report is a Recommended Plumbing Code, and it is the hope and expectation of many of those who have the best interests of the plumbing industry at heart, that this code may become the basis for municipal plumbing regulation throughout the country.

A national plumbing code has long been the dream of many, and this, it seems to us, is a very definite step in that direction. Anything that we can do through these articles, to further the establishment of a national plumbing code we shall gladly do, and we might say further that there is more encouragement and satisfaction in working for this object now that the government report has made the first step, for this step has been taken in a scientific manner. The thoroughness of this work leads us to believe that there is no guesswork about it.

The government commission worked steadily for two years, conducting experimental work along every important line, and the practical plumber, when he reads the

report will agree that the experiments were conducted under actual plumbing conditions.

SCIENTIFIC BASIS FOR STATE AND LOCAL CODES

REFERRING to the report, Secretary Hoover himself has written,—"There is now a scientific basis upon which state and local codes and small-dwelling installations may be based. The way is opened for effective standardization of plumbing supplies, with reduced costs to the industry and savings to the consumer."

Recently we have received copies of the plumbing codes of a great many of our leading cities, and to show the great need of standardization, one needs only to run through these pamphlets.

The matter of pipe sizes is certainly one of the most erratic subjects that the plumbing code has to handle. It is one size in one city and another size in another. Of course one size is right, and the other is wrong. If the wrong size is wrong because it is too small, it is not rendering proper service; if it is wrong because it is too large, someone is paying more money for his plumbing than he should pay. In either case there is an erroneous condition, and if anything can be done to correct such a situation, let's help to get it done.

The Hoover report makes certain recommendations, and it seems to us that on general principles they ought to be good ones. So far as we know, there has previously been very little in the line of scientific knowledge to govern the determination of pipe sizes. Now that scientific experimentation has definitely tackled the subject in an entirely practical manner, we should at least be willing to listen to what has been recommended as a result. Accordingly, we are giving you the conclusions and leading facts presented by this report.

Table 1.—Rates of Discharge from Plumbing Fixtures

Fixture	Outlet nominal diameter	Trap and waste	Rate Gals. per min.	Velocity in drain per second	Time required to empty
	Inches	*Inches*		*Feet*	
Basin	1¼	1¼	7.5	1.9+	12 seconds.
Sink	1½	1½	11.3	2.0	30 seconds.
Bathtub	1½	1½	15.0	2.7+	1½ to 2 minutes.
	2	2	26.3	2.0+	1 to 1¼ minutes.
Laundry tub	1½	1½	22.5	4.0	20 seconds.
Common fixture with one trap	1½	1½	22.5	4.0	20 seconds up for one. 40 seconds for two.
Water-closets	3	3	45.1	2.0+	6 to 10 seconds.

Outlets from fixtures are commonly made one nominal size smaller than the trap for convenience in making slip-union joints, a practice that offers other advantages; hence the actual diameter is less than stated nominal values, varying from one-eighth to one-fourth inch.

Time for emptying the basin and sink are given for the full fixture 1½ and 6 gallons capacity, respectively. The time given for other fixtures gives a range that will vary with the capacity of the fixture and extent of filling.

No determinations were made with 2-inch bathtub outlets, and the values given represent an estimate to the nearest one-half fixture unit.

The entire work was based on the following:—

"In order to study the capacity of house drainage systems, it was found desirable to establish a unit of fixture discharge—a unit involving both volume and time, that is, rate. The rate of discharge of an ordinary washbasin having a nominal 1¼-inch outlet, trap and waste was found to be about 7.5 gallons per minute, a figure so near to 1 cu. ft. per minute that the latter was taken as the definition of one fixture unit. The maximum rate of discharge of other fixtures may be expressed in terms of this unit. For example, it will be seen from Table 1, that a sink with a 1½-inch outlet is equivalent to 1½ units; a bathtub with a 1½-inch outlet, to 2 units; and a water-closet, to 6 units. Fixtures differ a great deal, however, and minor details of design may considerably affect the rate of discharge. It would be useful in designing plumbing systems to know the unit value of each of the common fixtures on the market. No attempt was made to collect this information, although a dozen or more fixtures were studied with reference to their rates of discharge."

Table 1, mentioned above, is shown herewith, and is the result of the experimental work carried on by the commission.

Possibly a table of this character has been worked up at some previous time, but we are not aware of such a fact, and doubt whether there is another table in existence giving just this kind of information, and we believe it should be interesting and of value to many of our readers.

Based on Table 1, the report gives the following:—

Fixture Unit.—The following table based on the rate of discharge from a lavatory as the unit shall be employed to determine fixture equivalents:

	Fixture units
One lavatory or wash basin	1
One kitchen sink	1½
One bathtub	2
One laundry tray	3
One combination fixture	3
One urinal	3
One shower bath	3
One floor drain	3
One slop sink	4
One water-closet	6

One hundred and eighty sq. ft. of roof or drained area in horizontal projection shall count as one fixture unit.

Having determined the discharge equivalent of each fixture as shown in this table, the information was available that was needed in determining the sizes of waste and soil stacks, and the section covering this point, reads as follows:—

Soil and Waste Stacks.—The required size of a soil or waste stack shall be independently determined by the total fixture units of all fixtures connected to the stack in accordance with the following tables:

Waste Stacks

Number fixture units	Diameter of stack	Permitted length
	Inches	*Feet*
1	1¼	45
2 to 8	1½	60
9 to 18	2	75
19 to 36	2½	105

Soil and Waste Stacks

Number fixture units	Number of water-closets or equivalent	Diameter of stack	Maximum permitted length
		Inches	*Feet*
37 to 72	1 to 12	3	150
73 to 300	13 to 50	4	225
301 to 720	51 to 120	5	300
721 to 1,080	121 to 180	6	400
1,081 to 1,920	181 to 320	8	600

Restrictions.—No water-closet shall discharge into a stack less than 3 inches in diameter. Not more than three water-closets or their equivalent in fixture units

shall discharge into a 3-inch stack from a 3-inch branch, and not more than two such branches may connect to a 3-inch stack at the same point or level.

HOW TO USE THESE TABLES

FROM the foregoing then, it will be seen that we have the information that we need in determining the sizes of stacks required for any given building.

For instance, if a building is to be erected which is to contain 100 lavatories, 50 water-closets, 25 bathtubs, 10 kitchen sinks, 10 laundry trays and 15 urinals, what size of stack would be required, provided all the fixtures discharged to the one stack? Referring to the table of fixture units, the total fixture units that the stack will have to handle may be estimated as follows:—

	Fixture Units
100 lavatories	100
50 water-closets	300
25 bathtubs	50
10 kitchen sinks	15
10 laundry trays	30
15 urinals	45
Total fixture units	540

Referring to the foregoing table of soil and waste stack sizes, we find that for 540 fixture units, the size required would be 5-in. This seems a very small size for the amount of work required of it, but one sure thing is that many times, and perhaps in a majority of cases, stacks are of larger size than is necessary, and one of the things this report emphasizes is the use of smaller sizes when such usage is safe.

The point of great importance is that on no plumbing system are all of the fixtures discharged at exactly the same instant. Therefore it would be a foolish waste of money and material, to design the system so that the stack which we are considering would be so large that it could handle the simultaneous discharge of every fixture in the building. The report takes up in scientific manner, the "probability of coincident discharge of the various fixtures, based upon the observed frequency of use, the duration of the individual discharge, and the predetermined rates of discharge of the various fixtures."

Every one of our readers would find the reading of this part of the report very convincing, and we urge upon you, in your own interest, its attentive reading.

In addition to soil and waste stacks, sizes of drains and sewers were also determined in this government report, according to the following:—

SIZE OF DRAINS AND SEWERS

THE required size of sanitary house drains and sanitary house sewers shall be determined on the basis of the total number of fixture units drained by them in accordance with the table on this page.

The required sizes of storm-water house drains and house sewers and other lateral storm drains shall be determined on the basis of the total drained area in horizontal projection in accordance with the other table on this page.

Government determinations covering other important features, are as follows:—

Combined Storm and Sanitary Sewer Systems.—Whenever a combined sewer system is employed, the required size of the house sewer shall be determined by adding to the drained area in sq. ft. 180 sq. ft. for each "fixture unit" on the sanitary system and then applying the total to the following table for storm sewers, except that no combined sanitary and storm sewer shall be less than 4 inches in diameter. The required sizes of the sanitary house drain and the storm house drain up to their point of junction may be independently determined from the table.

Sanitary Systems Only

Fixture units	Slope: ⅛ inch to 1 foot	Slope: ¼ inch to 1 foot	Slope: ½ inch to 1 foot	Number water-closets or equivalent
6 to 12 ... diam. in inches	4	3	.....	1–2
13 to 24 ... do	4	4	3	3–4
25 to 72 ... do	6	5	4	5–12
73 to 300 ... do	8	6	5	13–50
301 to 720 ... do	8	8	6	51–120
721 to 1,080 ... do	10	10	8	121–180
1,081 to 1,920 ... do	12	12	10	181–320

Size of House Drain and Sewer for Storm Water Only

Number of square feet drained area	Slope: ⅛ inch to 1 foot	Slope: ¼ inch to 1 foot	Slope: ½ inch to 1 foot
Up to 90 ... diam. in inches	1½	1½	1½
91 to 400 ... do	3	2	2
401 to 660 ... do	3	3	2
661 to 1,200 ... do	4	3	3
1,201 to 1,800 ... do	4	4	3
1,801 to 2,500 ... do	5	4	4
2,501 to 4,100 ... do	5	5	4
4,101 to 4,600 ... do	6	5	5
4,601 to 5,300 ... do	6	6	5
5,301 to 7,500 ... do	8	6	6
7,501 to 11,100 ... do	8	8	6
11,101 to 15,700 ... do	10	8	8
15,701 to 19,500 ... do	10	10	8
19,501 to 24,800 ... do	12	10	8
24,801 to 31,000 ... do	12	12	10
31,001 to 44,000 ... do	14	12	10
44,001 to 60,000 ... do	14	14	12

Size of Gutters and Leaders.—No gutter or inside leader shall be of less size than the following:

Area of roof (in square feet)	Gutter	Leader
	Inches	*Inches*
Up to 90	3	1½
91 to 270	4	2
271 to 810	4	2½
811 to 1,800	5	3
1,801 to 3,600	6	4
3,601 to 5,500	8	5
5,501 to 9,600	10	6

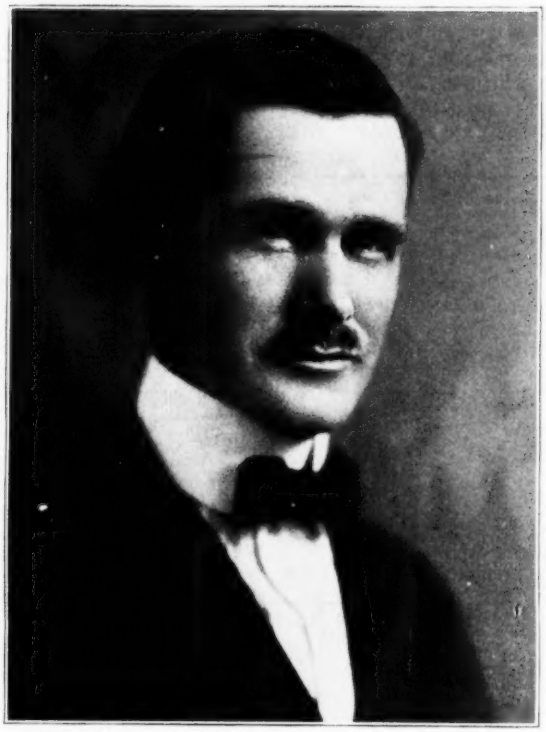
Refrigerator Wastes.—Refrigerator-waste pipes shall be not less than 1¼ inches for 1 opening, 1½ inches for 3 openings, and for 4 to 12 openings must be not less than 2 inches, and shall have at each opening a trap, and clean-out at angles, so arranged as properly to flush and clean pipe. Such waste pipes shall be continued not less than full size through the roof, except where such fixtures are located in the basement or first floor.

THIS DATA OF GREAT VALUE TO THE TRADE

WE believe the tables and data shown in this article to be of great value, and it has seemed to us of special importance that plumbing inspectors, who have so much authority in local matters covering these matters, should make a thorough study of this subject, as well as many others, as taken up in this official report.

The Open Forum

You will enjoy every word of this account of theshort course at Pittsburgh



Prof. Samuel E. Dibble, who played an important part in the instructional work of the Carnegie Tech Short Course

At Carnegie Tech

It is a fitting introduction to the technical information coming later

IT was a lively meeting when it started out, this last gathering of students of the plumbing and heating Short Course, November 12, 13 and 14, at Carnegie Tech. Members from Philadelphia, Wilkes-Barre and from many other points in the state kept the walls of the classroom reverberating with songs, impromptu speeches and cheers just like college boys. Many of them wore the college "plebe" cap so much in evidence on the grounds at Carnegie Tech. Under the direction of their cheer leader, the Philadelphians made themselves heard by means of their newly adopted cry: "BATHTUBS — WATER-CLOSETS-AND-WASTE-PIPES — HOPPERS — DRAINS — STOPPED-UP-TIGHT — DO-WE-CLEAN-THEM — WELL — I — GUESS — PHILLY, PHILLY — YES — YES — YES!"

When Dr. Connelley appeared, however, the meeting took on another note. Each one realized that he had come to Carnegie Tech for serious business,—business concerning the future of plumbing and heating, as well as the comfort and well-being of the people of the State of Pennsylvania, and of the nation.

The last meeting was an open forum for the discussion of the course, a sort of summing-up of what had been learned. It was brought out that the course is to be made an annual affair, and plans are now being prepared that will insure the next course being a much greater success than the one just closed.

Dr. Connelley told how Andrew Carnegie became interested in the education of people in various vocations and trades. When a young man, Mr. Carnegie conceived of the idea of making it possible for many people to acquire an education who were not able to do so without assistance. As he accumulated wealth he put a great deal of his time and money into such educational projects. In 1900 he established the school which bears his name, the Carnegie Institute of Technology. This school has grown until it is now one of the leading schools of the country. It offers training in many trades and vocations.

MR. VOGELPOHL SPEAKS

JOHN J. VOGELPOHL, president of the National Association of Master Plumbers, was called to the platform by Dr. Connelley, and expressed his high appreciation of the work done in the Short Course and of the good that had been accomplished. He was very much impressed with the ability of Carnegie Tech to serve the plumbing and heating trades. He hoped that it would be an annual affair, and expressed the opinion that if the Course were continued, the attendance would be doubled next year.

"New York University is going to give a course in plumbing starting next September," said Mr. Vogelpohl, "and the National Asociation is going to pay the tuition of two students each year. These students are to be plumbers' sons and will be chosen by competitive examination." Schools are to be started all over the country for apprentice plumbers. These apprentices will attend the school for half a day or so every week with pay.

Mr. Vogelpohl appealed to those present to send in their ideas and suggestions for improving the Short Course, and to come back next year and bring others with them

PUT PLUMBING ON THE FRONT STREET WHERE IT BELONGS

MR. VOGELPOHL then spoke on standardization, and the minimum code of requirements, prepared by the Hoover Commission, on Vocational Schools, and on the present status of plumbing and heating.

"Before grocers had even thought of keeping covers over their food, before butchers had thought of keeping their meat so that it would not be contaminated by flies, or so that it could not be handled by customers, before there were any pure food laws, the National Association of Master Plumbers was looking out for the health of the nation by the study and advocacy of proper plumbing. And its work is going on and on. We have learned a great deal at this Short Course, and it is up to each one of us to bring plumbing up out of the basement and put it on the front street where it belongs."

"WE WILL ACCOMPLISH IN THE NEXT FIVE YEARS, IN MY OPINION, GREATER THINGS THAN HAVE BEEN DONE ALL THE PREVIOUS YEARS OF OUR HISTORY, AND WE ARE FORTUNATE INDEED, TO BE HERE TOGETHER TONIGHT IN THIS WONDERFUL INSTITUTION. IF IT WERE NOT FOR THE

NATIONAL ASSOCIATION OF MASTER PLUMBERS, PLUMBING WOULD NOT BE THE GREAT PROFESSION THAT IT IS TODAY. WE MIGHT STILL BE GOING AROUND WITH A CARPET-BAG FILLED WITH A FEW TOOLS, BUT THROUGH UNSELFISH WORK BY MEMBERS OF THE CRAFT WE HAVE BROUGHT THE PLUMBING BUSINESS NOW WHERE IT IS RECOGNIZED AND HONORED BY THE GREAT EDUCATIONAL INSTITUTIONS OF OUR COUNTRY."

E. L. Bowman, educational director of the National Trade Extension Bureau, said: "I think perhaps a big white milestone has been set up in plumbing and heating history of Pennsylvania by means of this course. It will also mark a step forward in the history of this institution. I think we can now look forward to renewed interest in the technical lines of our work. When you go back home you will all go back with new vision.

"There is one word," said Mr. Bowman, "into which we can boil down this entire work, and that word is 'co-operation'." After elaborating upon the co-operation of the various parts of the plumbing field, he outlined the various activities of the National Trade Extension Bureau, the lecture department, the various lecturers, the accounting department, the sales department, the statistical department, etc.

Mr. Bowman's attendance at the Short Course was partly to assist in making arrangements for the plumbing teachers' classes which will be conducted in February, 1925, at the Carnegie Institute of Technology, and which will be described in future issues of this journal.

"Will you men see to it," said Mr. Bowman, "that men are sent to this teaching course from cities of 40,000 or over, men who will not only brush up all their present knowledge of plumbing, but will learn to teach plumbing as it should be taught."

Following the addresses of Mr. Vogelpohl and Mr. Bowman, the meeting was thrown open for general discussions. A number of men spoke. All of them were very enthusiastic over the three days' intensive training they had received. This course, some of them said, was undoubtedly the best course of its kind that had ever been held. All of them promised to come back next year and to bring others with them.

On Saturday following the close of the Course, several of the attendants were taken to McKeesport, Pa., where they visited the plant of the National Tube Company. T. M. Dugan, as conductor of the party, showed them the boiler room and electrical plant of this mammoth institution. They visited the ore dump and followed the ore until it came out as finished pipe.

Under the direction of Mr. Dugan, who has charge of all the plumbing work in the National Tube Company plant, the party followed the metal to the blast furnaces, saw the molten metal hauled in cars to the Bessemer converter, watched the pouring of the metal into ingots, saw the ingots taken to the soaking pits, studied the processes of rolling the ingots into bars, then into skelp. From this point they followed the skelp to the bending furnaces, to the welding furnaces, to the threading machines, until it came out as finished pipe, ready for the market.

A new comfort station, Three Rivers, Mich., is to be part of the Michigan Independent Oil Co.'s new service station at Fourth and Flint avenues.

The Board of Awards of Baltimore, Md., of which Mayor Howard W. Jackson is president, is about to let the contract for a comfort station to be located on the south side of Hollins street, west of Arlington avenue, and another for the southeast corner of Forrest and McElderry streets.

Competition, Overhead, *and* Profit

(Continued from Page 25)

can easily be analyzed. A manufacturer of hot water boilers, for instance, may make errors in figuring out the cost, just as does the master plumber and heating contractor. He may also pursue an unwise business policy. But the errors made in figuring out the cost do not do such harm here as in the plumbing and heating contractors' case, because the manufacturer can easily obtain the list prices of other manufacturers of hot water boilers. If his own prices are higher he will not be able to sell to the plumbing and heating contractor unless the quality and construction of his boilers or the service is better than the quality and service delivered by the competing manufacturer.

A FAIRLY EASY SITUATION

IF our manufacturer figures a lower price on account of errors he is free to raise his prices up to the prices of his competitors, and thus his errors have not done so much harm. If the manufacturer pursues an unwise business policy, he does not make the profit which he should make, or he even loses. In this case the manufacturer will not attempt to raise the prices, but he will make great efforts to find out the reasons for the losses. As in the manufacturing field of plumbing and heating goods list prices are used, for that reason the prices are nearly the same for the same quality. In other words, competition in this field is open, and for that reason it is a competition of quality and service and not that of prices. Of course, you benefit by this situation, because the prosperity of the manufacturer depends mainly upon quality and good service.

The situation in the plumbing and heating industries, however, is quite different. There are no list prices which can be used in comparing your own cost or expenses with the cost and expenses of competing plumbing and heating firms. When you learn that you are too high in price, you have already lost the job. Competition in the plumbing and heating field is that of prices rather than of quality and service. Of course, neither the man in the field nor the public benefits by such a situation.

The greatest disadvantage of the kind of competition found in the plumbing and heating industries is, that generally not so much profit is made on a certain job as should have been made according to market conditions. For instance, if you get a contract at the figure of $2,000, you would probably have been given the same contract at a price of $2,200, because the next price higher than yours may have been $2,300 or even higher. What can be done to meet this will be explained in the following installments.

J. W. Vick, of McDuff avenue, Jacksonville, Fla., has the plumbing contract on the J. B. Pharis residence in St. John's Park, near Jacksonville.

Thomas Boyd, of Walnut street, Jacksonville, Fla., has the plumbing contracts on the Victor Zambetti bungalows in Panama Garden, near Jacksonville. He also has the plumbing contract on several new residences.

B. S. Milligan Company, of Columbia, S. C., has been awarded the contract for the installation of additional plumbing facilities in the west wing of the Logan school, in that city. This company also has the contract for the plumbing work on the addition to the Christian church building.

Isn't this the kind of plumbing and heating establishment some of you dream about? Read what built it!

Written *in* Reading

By MILT MARVELS

HERE'S something I've noticed in traveling around the country. Before I've had the pleasure of shaking hands with the live master plumber I may have traveled a thousand miles to see, I know I'm going to meet a man who has brought something more than his tools to the plumbing and heating game. Before I have any idea of the volume of business he's doing, I know it will be large.

How do I know? Well, when I approach his place of business I can see that he has put some thought into its appearance. And perhaps I see a delivery truck standing at the curb which tells me the same story. He is practicing the sanitation which he is preaching to his customers. Actions, you know, speak louder than words.

INTRODUCING CORBIT BROTHERS

THIS thought was in my mind as I traversed the street leading to the home of Corbit Brothers Plumbing and Heating Company, in Reading, Pa. Their fine two-story brick building is indeed imposing. In the photograph of their place of business reproduced on this page you cannot see the display window, but I'll tell you that passers-by are impressed with it. Of course it is always scrupulously clean. And the fixtures on display are so arranged that even a casual glance gives the impression of order and cleanliness.

These things have a tremendous selling power. You wouldn't listen to a doctor who told you that cleanliness is necessary to good health, if he didn't keep his office clean. And the public won't listen to a plumber who preaches sanitation when his shop and his display window contradict every word he says.

Notice the cluster of lights at each side of the entrance, and the neat metal plaques which carry the name of the company. These features count, for they make a "quality" impression that is invaluable.

I was right in my deduction that Corbit Brothers were putting a great deal of thought into the "how" of building

a worthwhile business. The business was established in 1913 in a small way, with a capital of $500. And right at the start one fundamental policy was adopted to govern the company's dealings with everybody—customers, jobbers and manufacturers, and employes. That policy may be summed up in the words, "a square deal."

You'll agree with me, especially after this instructive visit to Corbit Brothers' establishment, that there isn't any policy a master can adopt which will win more friends for him or help him to build a real business more quickly.

CUSTOMERS FIRST

WITH Corbit Brothers the customer comes first. They maintain personal contact with every one of their customers, and the customer must be perfectly satisfied before the company will accept a penny of payment. You can see for yourself that such a practice will win confidence. Every home-owner trusts the man who is willing to stand or fall by his work. And the man who settles the bills has a feeling of safety so long as he does not have to pay out his hard-earned money before he is satisfied. Most of us can cite instances where, once a bill had been paid, we were unable to get proper service when something went wrong. That's why the practice of not accepting payment until the customer is satisfied wins friends.

TRUCKS FOR FAST SERVICE

IN order to give the customer prompt service, the company has two delivery trucks and two "plumbing shops on wheels." This enables them to meet the needs of customers with all possible speed. And in order to give the customer the best possible service in the shop, there is one man in charge of each department. This policy is a very good one, and is practiced by many of the larger retail stores. Customers become acquainted with the man who is to serve them in the shop, and as time goes on his knowledge of the customer's needs in his line enables him to make constructive suggestions about the latter's heating or sanitation problems. It's just one of those little points of service that have a big effect in increasing volume and making friends.

But Corbit Brothers do not expect the square-deal policy to carry the whole burden of building a bigger business. They keep right on reminding the public, through advertising, of the service they offer in making life healthier and happier. Newspaper advertising is used, with an appropriation of $1,000 a year for this purpose. A mailing list of a thousand names receives circulars from time to time, and the company has three billboards in good locations. They carry advertisements on two theatre curtains; and of course they use "Bath a Day" stickers and signs.

I mentioned at the beginning of this article the fact that the kind of a delivery truck a master operated usually indicated how much thought he was putting into the building of a better business. Corbit Brothers delivery trucks are painted white, with gold lettering. They are probably the best known trucks in Reading, because they are so distinctive.

A FLOAT WITH A MESSAGE

YOU will notice in the photograph a float which had a fine educational value. The bathrooms of three different periods are shown, going back to the old-fashioned outdoor pump, and coming down to the very latest equipment for the modern home. With the "Bath a Day" sign painted on the side, this float must have been one of the most unusual in the parade. People are bound to remember that kind of advertising because of the touch of humor in the idea.

To go back to the "square deal" policy as it is applied to the employes of this progressive company: There is only one way to keep harmony in any organization, and that is by giving every member of it a square deal. If every master were careful to follow this rule, there would be less labor trouble and turnover. It is the only way to build a permanent organization which can be depended upon to give the kind of customer satisfaction which Corbit Brothers insist upon—the kind which has enabled them to grow as they have in the eleven years they have been operating.

Every man in this organization gets the same treatment. Where praise is due, it's given, and criticism is made when required. Every Winter the company gives its employes a banquet, and every Summer there is an outing. These two events are looked forward to, and the greatest possible enjoyment is extracted from them.

MECHANICS ARE STOCKHOLDERS

AN even closer and more harmonious relationship is made possible by the fact that, the company being incorporated, eight of the mechanics are stockholders. It is a truly fine indication that the square-deal policy has borne fruit, when men invest their savings in the company. It indicates confidence in the management and a belief in the future of the company. And those eight men, believe me, are better workers because they are stockholders!

You would naturally expect to find that a company practicing such sound methods would see to it that each estimate carried overhead and profit, based on volume. But Corbit Brothers have gone a step farther in this direction. In the first place, once a month the books are audited by a New York firm. Starting with this point—knowing just what they have done each month, what costs have amounted to, and what profit has been realized—they lay plans for increasing volume and profits **without increasing overhead to any great extent.** In other words, without adding more men or equipment, they plan for more business, making the investment already in the company do a bigger volume of work.

IF NOT, WHY NOT?

CORBIT BROTHERS have one other rule which enables them to keep down costs. They discount every bill, a practice that ought to be indulged in by every master. To appreciate what that means in the way of savings, just think back over the years you have been in business. If you had discounted every bill you ever received, what would be the total amount of the discount saved? In addition, such a practice establishes credit with jobbers, and is proof of a square-deal policy with them as well as with customers and employes.

These are the main facts concerning the success of Corbit Brothers. They have been careful always that their shop and their delivery equipment are proper representatives of sanitation. They have adopted a square-deal policy to govern dealings with customers, employes, and jobbers and manufacturers. They don't guess at costs—they know, through monthly audits. They discount bills, and they are generous users of effective advertising.

What you want to know is, has it paid? Since 1913, Corbit Brothers have built a $300,000 annual business. They are now planning two additional floors for their building. They started where many another master has, with small capital and large ambitions. What they have achieved shows that any master can realize his ambitions if he thinks hard, plans carefully, and puts his trust in a square-deal policy.

Oil-Burner Essentials

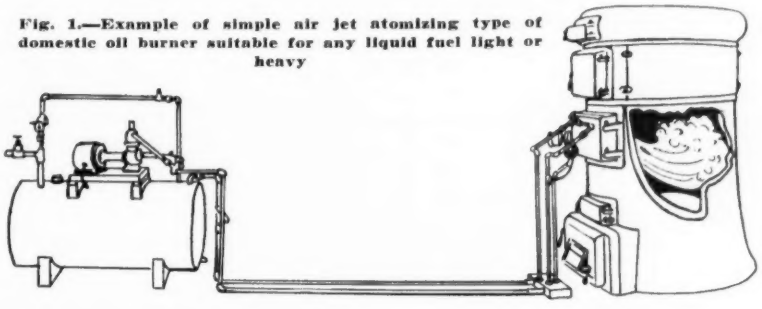
By W. T. Dean

Who discussed in the October 11 issue the advantages of oil for fuel, the future oil supply, and basic principles of oil-burner construction. In this second practical article he treats of methods of ignition, supply of combustion air, and automatic control

BURNERS employing true fuel oil for domestic heating are strictly limited to devices having some definite means for breaking up the oil into a fine mist or spray so that it can be burned easily. Only two methods of accomplishing this have been developed thus far. The first method has followed the practice which is widely used in industrial heating work and atomizes the oil by a jet of air. (See Fig. 1.) In industrial work, steam is sometimes used in a similar manner. The sole function of the jet of air or steam is to divide the oil into the finest possible particles, and no attempt is made to supply the combustion air in such atomizing burners. Usually from 5 to 10 per cent only of the total air for combustion is supplied through the burner as an atomizing agent.

The forms of atomizing burners are numerous. It is claimed that the external atomizer type is free from accumulation of carbon deposits. The combustion air for such systems is supplied by natural draft or occasionally by fan blowers operating at low pressure.

Fig. 1.—Example of simple air jet atomizing type of domestic oil burner suitable for any liquid fuel light or heavy



In general, the air atomizing burner functions precisely as does the ordinary nose or throat spray in which the air for atomizing the liquid is supplied by a bulb. As a matter of fact, anyone can make a very pretty flame by filling an ordinary throat atomizer bottle with kerosene and igniting the atomized mist with a match.

It is this simple, effective principle that is most widely used in the atomization of heavy fuel oil. This method possesses the advantages of simplicity and absence of moving parts, without the necessity of close proximity of any machinery to the heat of the firebox.

The other method of breaking up heavy fuel oil involves throwing the liquid from the rim of a rapidly revolving cup. (See Figs. 2 and 3.) Its effectiveness depends wholly on the peripheral velocity of the rim of the cup. The oil thus thrown from the rim of the cup is crossed by a stream of air, sometimes forced by baffles to form a vortex rotating in the opposite direction from the oil particles, the object being to secure as rapid and complete a mixture of the finely divided oil and air as possible.

This method, sometimes described as "mechanical atomization," has been developed in recent years, largely on the Pacific Coast, where oil has been cheap and heavy oils prevalent. The method is very effective as a means of securing good combustion. In order to atomize moderately heavy oil on a small scale, it is necessary that the cup be of quite small diameter. So the designer builds equipment for extremely high speed. One burner manufacturer who uses this method with a direct connected motor operates his cup at 7,000 to 10,000 revolutions per minute, or approximately two miles per minute rim velocity. Domestic heating requires intermittent operation of the burner, depending upon weather conditions, and the oil burner buyer should ascertain what effect the residual heat in the combustion chamber has upon the operating mechanism during the periods of shut-down. Films of oil remaining at the time of a shut-down, quickly carbonize and the parts require frequent cleaning.

Various designers place the revolving cups in the center of the hearth, the cups revolving in a horizontal plane, or project them from a furnace door, the cups revolving in a vertical plane.

In the earlier developments, devices of this character were not designed for intermittent operation by automatic control, and the burner mechanism was attached to a hinged door which could be swung out of position and away from the reflected heat from the fire box when not in use. Many of the designers of automatic oil burners of this class do not usually use standard heavy fuel oil. Keeping the burner clean makes it more efficient.

Excellent results have been obtained by the use of air jet turbines to spin the revolving cup. The necessary

high speed can be obtained very readily. The delicate little turbine wheels should not be allowed to become gummy from oil and careful attention must be given to the lubrication for the ball bearings particularly on account of the proximity of the radiant heat from the combustion chamber. If the turbine stops the fire dies out, flooding ensues, and if oil is pumped into the combustion chamber and burned without atomization, dense clouds of smoke will follow.

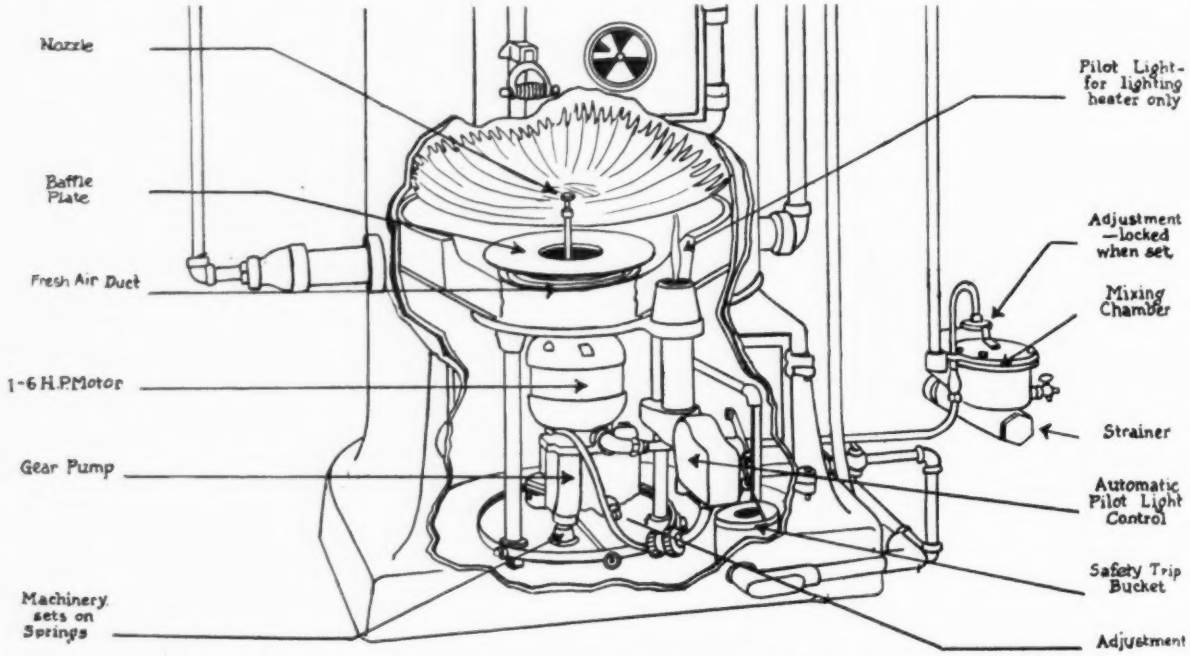


Fig. 2.—Revolving cup type oil burner with motor directly connected in ash pit. Motor runs at high speed

WHY OIL BURNERS ARE RUN INTERMITTENTLY

GOOD results in heating moderate-sized boilers with revolving cup or mechanical atomizer type of burner are obtained when the grates are replaced by a circular hearth, the cup projecting through a hole in the center. If it were practical to operate heating plants continuously, reducing the fire as the demand for heat decreased these burners would be theoretically ideal. It is not possible to burn efficiently in a fire box of fixed size, widely varying amounts of oil. In fact, it is practically impossible to do so. Oil requires for best combustion, 3 cu. ft. of combustion space for each gallon burned per hour. A very low fire results in smoke, unburned oil and frequently the fires go out entirely. An excessively high fire means smoke and soot on heating surfaces. It is, of course, not feasible to change the size of the fire pot for a wide range in amount of fuel burned. It is, therefore, necessary to fire intermittently in order to cover the varying heat requirements of the whole heating season.

The writer's own home which has been heated with oil for many years by an automatic intermittently fired burner, shows the range of this variation clearly. In weather 10 degrees below zero, the burner may operate a total of 12 hours out of 24. As the weather moderates, the firing period may be as low as a half hour mornings and evenings, while in early Fall and late Spring, the burner may be idle days at a stretch and only start up for a few minutes on account of a cold wind across the lake.

Again, as yet no device has been perfected which will feed positively a definite amount of oil and permit the amount desired to be set at the widely varying rates of flow required by house heating. This variation would have to cover a range from about ⅛ gal. to 5 gal. per hour, or a ratio of 40 to 1.

The vertical cup, revolving in the center of a circular fire box, is used quite successfully by several burner manufacturers. One uses a water-motor, taking water from city mains. This saves electric power but some communities object to the use of water-motors and others are afraid of the possibility of accidental overflow of oil into the sewerage systems. Water-motor systems are not susceptible to automatic control and are limited to light expensive fuels.

Some manufacturers of this type of burner use a vertical shaft motor directly attached to the revolving cup and operating at 7,000 to 10,000 revolutions per minute. In order to obtain these speeds, it is necessary to utilize the series wound commutator motor, and their engineers are to be congratulated upon the success they have achieved with high speed, vertical shafts, commutators with brushes, close proximity to the hot hearth and the mechanism located in the ash pit.

Other manufacturers drive the cups by means of beveled gears, the horizontal shaft extending out of the ash pit and coupled to an ordinary motor. (See Fig. 4.) This method is good. Mechanical difficulties and tendency to noisy operation of beveled gears should be guarded against and the heating fraternity is watching these various devices to see how they will stand the test of time.

The advantages of this type of oil burner are: Very complete combustion may be obtained with a minimum amount of excess air. The combustion is inherently quiet compared with some other methods. On the other hand, points to be considered are: high velocity of the revolving cups, maintaining bearings, and proper lubrication; effect of residual heat on oil cups during periods of non-firing; proper mounting of the motor drive mechanism for the cup; the effect of placing rather delicate equipment close to the fire and whether the cups will carbonize within

themselves and thereby decrease their own effectiveness.

The simple atomizing burner requires no machinery or moving parts in or near the fire. Nozzle equipment is of simple construction and is often adjusted and repaired by the householder who has little mechanical skill. It is susceptible to the use of oil of any gravity which is liquid enough to flow to the nozzle. This is the type of burner used in industrial work so extensively.

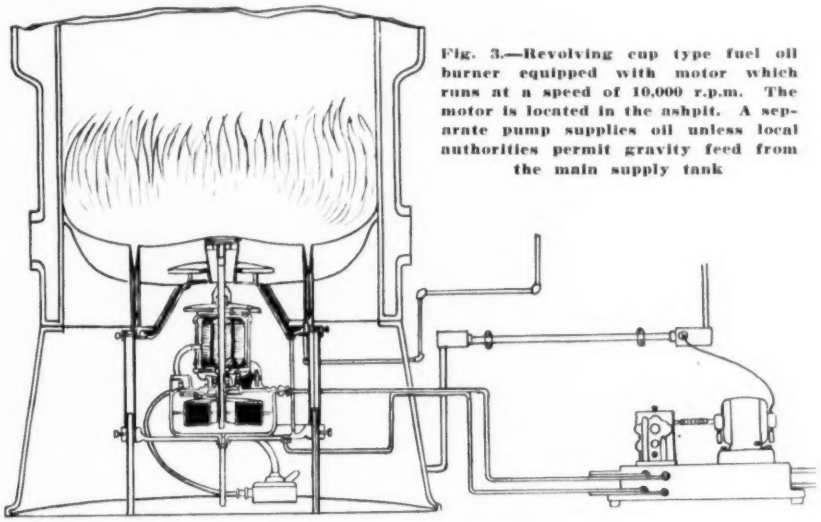


Fig. 3.—Revolving cup type fuel oil burner equipped with motor which runs at a speed of 10,000 r.p.m. The motor is located in the ashpit. A separate pump supplies oil unless local authorities permit gravity feed from the main supply tank

THE ASSEMBLED BURNER

ANOTHER type of fuel oil burner which is being produced in several slightly different forms, involves a motor-driven fan or blower with an oil-pump directly connected on the same shaft. The oil-pump is required to draw in the oil from the main storage tank and deliver it to the burner. Such an equipment is readily made up by assembling standard motors, blowers and oil-pumps. It should be borne in mind that a liquid particularly a viscous one, cannot be handled economically at the same motor speed as an extremely tenuous gas such as air. In order to get pressure and ecenomy out of the air blower, high speeds are necessary and inventors of such oil burners should guard against friction losses, heating and noise in the oil pump.

Some oil burner manufacturers object to the use of the pump to deliver oil directly to an oil burner, giving the reasons that the smallest practical oil-pump delivers a minimum of 30 times the amount of oil that can be burned. So the pumping of this oil requires power which is partly wasted. When the machine stops on signal from the thermostat the accumulated oil under pressure continues to flow, causes smoking, sooting of boiler flues and odors of unburned oil. The oil-pump cannot be made smaller as it must have sufficient displacement to create a vacuum in the suction line quite promptly. Any excess oil pumped must be returned to the storage tank.

Some burners using an oil-pump, employ rather high oil pressures and discharge the oil through a very fine orifice in the nozzle. Sometimes this orifice is located in a combustion tube which is shaped so as to throw the flame in some particular direction. Those who invent such devices should guard against the clogging of the fine orifices. If this is done, the combustion tube will sooner or later fill with carbon deposits stopping the functioning of the burner.

The use of compressed air to move the oil from the storage tank to the burner is regarded by many as a simple and safe method. An air pressure of 2 to 3 lbs. per sq. in. is sufficient, and this pressure is only maintained while there is a demand for oil. Such burners are not correctly classed as pressure-feed burners since the pressure is only applied to the oil when delivery is desired at the burner, and at such times the air is available to atomize the oil delivered. When the machine stops the oil flow stops and ceases entirely before the flow of atomizing air dies out.

The cost of handling the oil by air-pump where such a pump is used for atomizing, is small. Only the oil used is moved and this is displaced by the air pressure on a small service tank. To feed oil at the rate of 2 gallons per hour to a burner at say, 3 lb. pressure by air, requires only .00005 of a horse power. No meter can register this amount of energy.

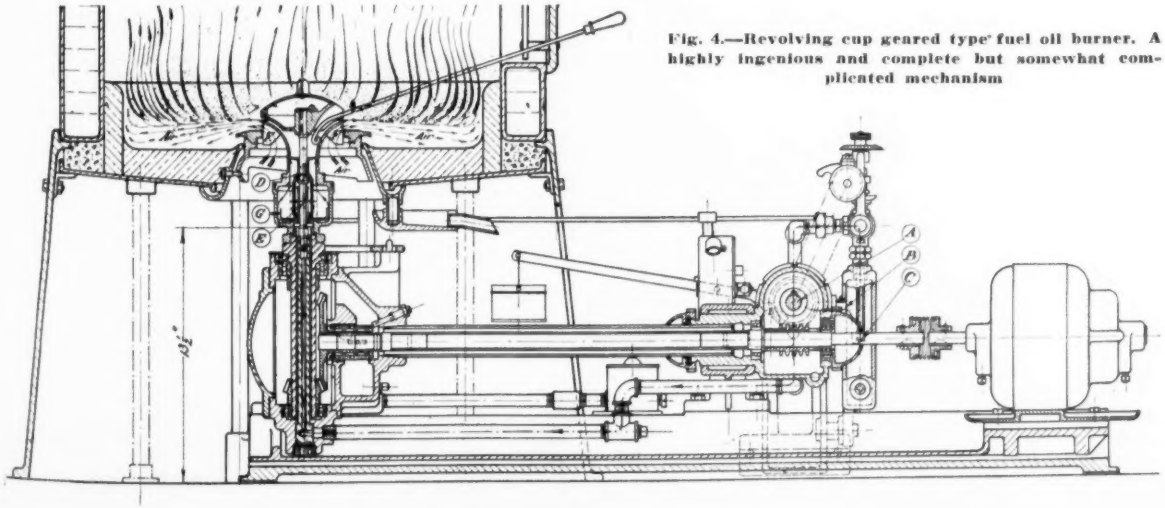


Fig. 4.—Revolving cup geared type fuel oil burner. A highly ingenious and complete but somewhat complicated mechanism

In order to refill the service tank, it is necessary to reverse the air-pump connection to the tank during non-firing periods, when the vacuum thus formed in the tank will cause the supply of oil to flow in from the main storage. Oil can only flow when the motor-driven compressor is running and delivering air for atomizing the oil, and the compressor-motor in turn is interlocked with an ignition safety device which prevents the motor from running unless the ignition operates.

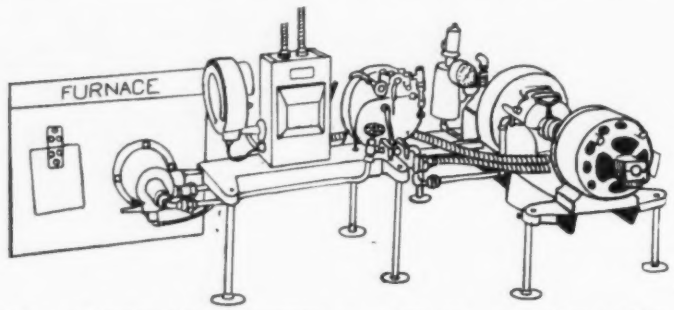


Fig. 5.—Showing the arrangement of motor and regulating devices with which one domestic burner is equipped

METHODS OF IGNITION

AUTOMATIC burners usually employ city illuminating gas to ignite the oil. Some use the electric spark for ignition. Some burners particularly of the fire-pot type require a gas flame of considerable size due to the way in which the oil is atomized.

In order to avoid the great expense of using large gas flames continuously, sometimes turn-down mechanisms are provided to reduce or shut off the supply of gas after ignition of the oil has occurred. A small amount of water in the oil sometimes causes the flame to go out and oil burner men should provide means for stopping the flow of oil in such cases. A drain pipe may be brought out from the fire pot and the overflowing oil collected in a drip cup so arranged as to cut off the supply of oil to the burner. Such devices are in quite general use. The fire pot and its lining become covered with oil, however, before the overflow can trip the safety and the possibility of a puff or explosion following re-ignition should be guarded against. Drip devices and automatic controls of every kind should be foolproof, however, and it should not be possible for the family cat to lie down under a drip can and prevent its working. The drain pipes from fire pots should also be clean so that the drip cup will work.

Other safety devices make use of the ignition flame of gas or the actual ignition of the oil itself to prevent the flow of unburned oil rather than to stop it after it has started flowing. Several such devices are available which are safe, having been given rigorous tests equivalent to many years' operation. There is no record of a fire ever having occurred by reason of the failure of approved devices of this character.

No one contemplating the enjoyment of the comfort and convenience of automatic heat should permit such an installation in his home unless it is provided with an ignition safety device of a dependable character.

The stack safety device consists of a thermostatic element placed in the smoke pipe near the boiler or furnace embodying an electrical switch which permits the burner to start but stops it in from 20 to 30 seconds unless ignition has occurred and the hot burned gases have reached the stack. Such safety devices are in use where illuminating gas is not available and where it is necessary to use kerosene or electrical ignition devices. Stack safeties are relied upon for protection against the danger of smoke and explosion from stacks or chimneys, which sometimes become clogged with soot, due to excess oil fed to the burner or due to insufficient draft.

In the use of the stack safety device, the time element and the necessity for its operation under widely varying stack temperatures, should be considered.

AIR SUPPLY

EACH gallon of oil burned requires 1,500 cu. ft. of air for complete combustion. An excess of from 15 to 25 per cent is usually supplied to insure absence of smoke. This combustion air is supplied by fans or blowers of various sorts or by natural draft. Distillate burners using metallic fire pots use blowers to provide the necessary air. Mechanical atomizers always use blowers but they are frequently of the nature of exhaust fans moving the air from the ash pit to the combustion chamber at low velocity. Gravity feed kerosene burners and air-jet atomizing fuel oil burners, usually make use of the stack or chimney draft which is of course, far cheaper as no electric power is required to provide a supply of air.

Every house has its chimney which is a free and automatic heat engine designed to move warm air (or smoke) from the basement to a point above the highest part of the building. Such chimneys are a necessity and cannot be dispensed with under any circumstances, so why not use them when possible, say some of the oil burner manufacturers, rather than to purchase electric power to do the same work.

When blowers are used, the maker should guard against undue increase in the static pressure in the combustion chamber and the possibility of a release of odors of burned oil in the boiler room which may permeate the building. Fire boxes are not sealed completely against air leaks.

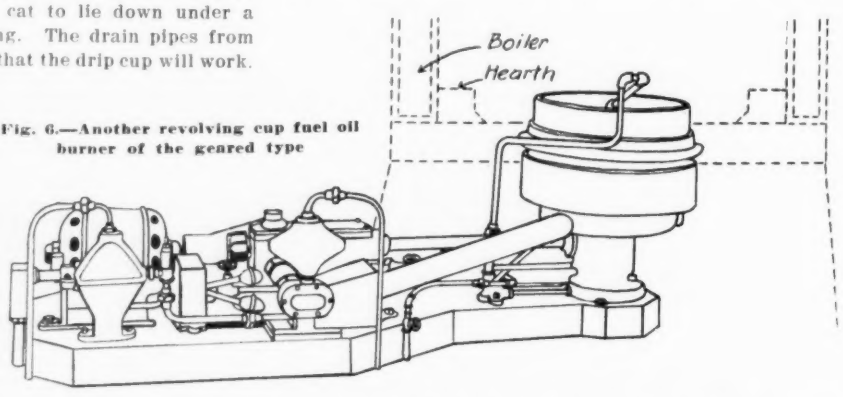
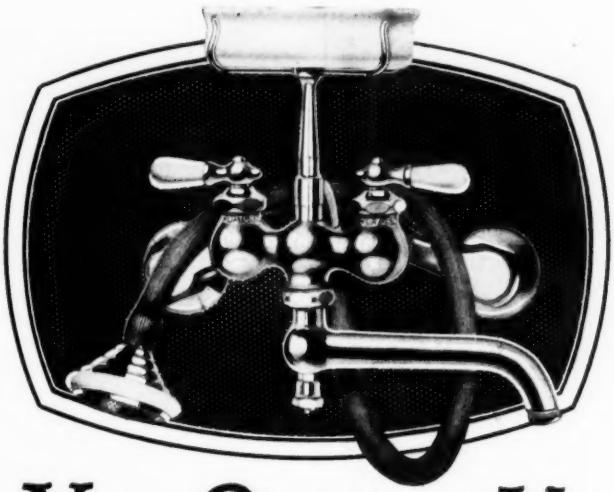


Fig. 6.—Another revolving cup fuel oil burner of the geared type

do not need to be so sealed because under normal operation with coal, the combustion chamber is under a partial vacuum from the chimney, hence any small cracks or leaky joints permit the escape of objectionable odors if a blower is used with an oil burner.

(Continued on Page 39)



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Make the **Classic Sink Fixture** a headliner in your business, and you will find profits coming your way. The Classic has been designed especially to aid the housewife in the small but often distasteful tasks of the kitchen, such as washing and rinsing dishes, cleaning the sink, watering plants, cleaning fresh fruits and vegetables, sprinkling clothes. Show her how the Classic makes all these tasks easier, and saves her time and labor.

Explain its superior construction. The standardized removable working unit which gives the Classic its long life. Compare its price with that of other labor-saving devices.

Every housewife wants a Classic. Get your share of profits in the great market awaiting you. Order a supply from your jobber. Or if you are not yet familiar with the Classic, send to us for a sample, together with a supply of the attractive "Selling Aids" which we have prepared to help you merchandize this superior sink appliance.

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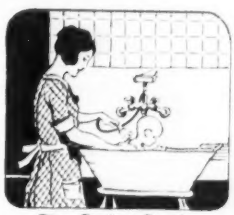

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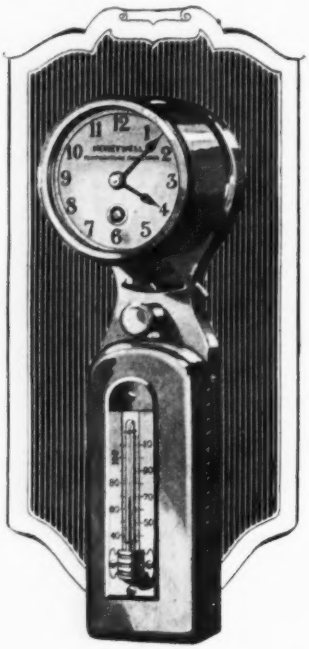
—like other Chicago Faucets is equipped with the Quaturn Removable Working Unit.



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The Honeywell Heating Specialties Co.
Wabash, Indiana

HONEYWELL
Temperature Regulators

Manufacturers of quality Temperature Controls distinguished by their minimum electric current requirements.

(Continued from Page 36)

THE ease of starting and stopping oil heating fires has brought about a wonderful development of thermostatic controls. The room thermostat used to control drafts and dampers has been in successful use for many years. In oil burning work, the same instrument is used, but it usually functions to start or stop the oil burner motor through an intermediate device called a relay or switch motor. Most thermostats are rather delicate in construction, designed to operate on but one or two degrees difference in temperature, consequently their electrical contacts are small and close together so that a low voltage electric current is necessary. The function of the relay is to utilize this low voltage current to operate a switch of sufficient size to start and stop the oil burner motor.

There are several such devices available which are thoroughly reliable. The switch-motor performs a similar duty. It consists of a miniature motor designed for low voltage operation and used to open and close the oil burner motor switch through a train of gears. This device is likewise extremely reliable. Of recent years, direct action thermostats have been devised in which a glass vacuum tube containing mercury is tilted, the mercury flowing from one end of the tube to the other; in so doing, effecting a contact between the electrical contacts sealed into the glass.

These devices are very attractive because of their simplicity and elimination of relays. In using devices of this class, one should consider whether or not it is possible to run conduit for 110 volt circuits up through the walls of buildings already occupied and decorated.

The very heart of any successful oil burning system is the thermostat. This is the device which, when properly located, signals to the boiler room for more or for less heat.

The location of the thermostat is of vital importance. It should be so placed as to reflect as closely as possible, the average temperature of the most lived-in portion of the house. It should be attached to an inner partition wall of the living room, library or dining room as near the center of the house as possible. It must not be placed in halls, on staircases, on an outside wall, over a radiator or register, nor on a wall at a point where hot or cold pipes or ducts may be concealed. It must not be placed where it is subjected to drafts from frequently opened doors or windows. When it is realized that this device is expected to open and close an electrical circuit on a temperature variation of but one or two degrees and to continue its functions without attention year after year, with only an infinitesimal amount of available energy, the manufacturers of these devices should receive well earned praise for their splendid achievements.

Thermostats are sometimes equipped with clocks to change the temperature at predetermined hours, but with the automatic oil burner, there is no such necessity as the heat is as really "on tap" as the water supply, and may be poured into the house as fast as needed. There is no economy in turning down the thermostat at night and turning it up in the morning; in fact, more oil will be consumed by this means than if the thermostat is left at 68 or 70 degrees all night, since all the fuel saved during the night will be required in the morning to restore the normal temperature.

If sleeping habits require open doors as well as open windows, then the doors to the room containing the thermostat may be closed at night and the usual living quarters will be normally and economically warmed. No unnecessary addition or complication should be permitted to any part of the oil burning system.

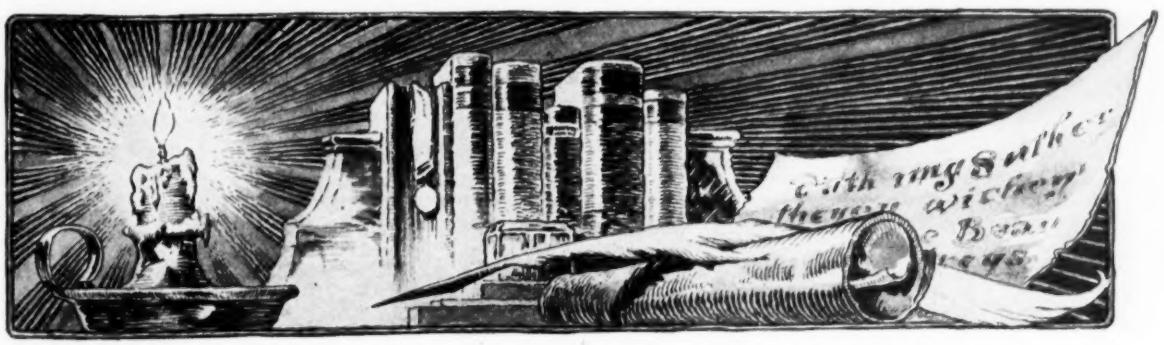
THE PRESSURESTAT

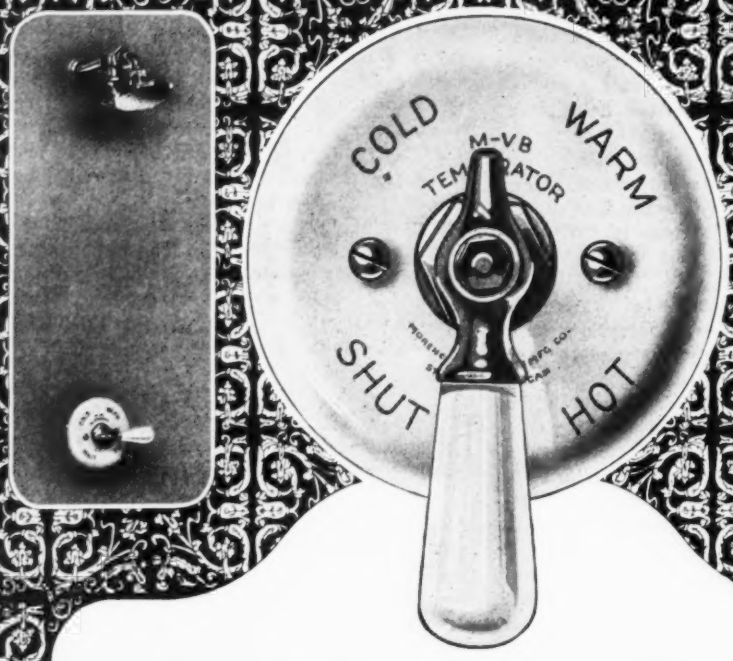
EVERY oil burning plant installed in a steam vapor or hot water boiler, is more efficient if equipped with a boiler control often called "pressurestat," "vaporstat," etc. These devices operate like the room thermostat but are attached to the boiler and are sensitive to the pressure in the boiler or the temperature of the water, as the case may be. Many oil burner manufacturers do not supply these devices as regular parts of their equipment but add them as extras, however, considering them necessary unless the burner selected has far less capacity than the boiler to which it is attached.

Dangerous steam pressures or water temperatures may be obtained by oil as easily as with coal. The function of the boiler control is to protect the boiler against these conditions which may be due to extreme weather conditions, low water or a window left open near the room thermostat. Some manufacturers claim that their burners require no boiler control, while others claim that an oil burning outfit without a boiler control will prove inadequate in extremely cold weather.

The relay or switch motor device used to translate the signals of the thermostats into action by the oil burner is an essential part of the control system, and many times a thermostat has been blamed for trouble deep seated in the relay.

Carefully compiled records show that 90 per cent of all minor complaints entailing "service" calls on oil burners relate to the thermostatic controls, hence the best obtainable are none too good, and the oil burner manufacturer who economizes in controls is inviting trouble.





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Plumbing-System Pressures —*Their Actions and Effects*

This is the last of a series on pressures. In it are presented the twenty conclusions reached during the Illinois Short Course experiments. You owe it to your customers to know these conclusions. Study these important facts

M. L. Enger, Professor of Mechanics and Hydraulics, University of Illinois

THE previous article closed with a discussion of the pressures in traps vented in different ways with vent pipes of different diameters and lengths. These tests were divided into three series.

For the second series of tests, to study the pressures created in a vented trap by the discharge of a fixture on the same horizontal waste pipe, the apparatus is shown in Fig. 10 in the previous issue to Fig 5 in this issue inclusive. Fig. 10, in previous issue, represents the condition when one or more water closets are discharged into the same horizontal waste pipe and where the readings of pressure are taken in a trap connected with a horizontal waste pipe between the soil-stack and the discharging water closet. Fig. 1 represents the conditions when the water closets discharging are between the soil-stack and the trap in which the pressures are read. Figures 2, 3, 4, and 5 represent slight differences in the arrangement of the piping. In Fig. 1 the vent pipe in some tests was closed at the crown of the trap; in other tests, the vent was closed at the valve shown, and still in other tests, the vent was open throughout its length. No venting was used in the arrangement of piping shown in Figs. 2 and 3. The arrangement of piping shown in Figs. 4 and 5 provides for loop venting, continuous venting or crown venting. The positions of the fixture and of the trap in which readings of pressure were made, as shown in Fig. 4, were interchanged in the arrangement shown in Fig. 5.

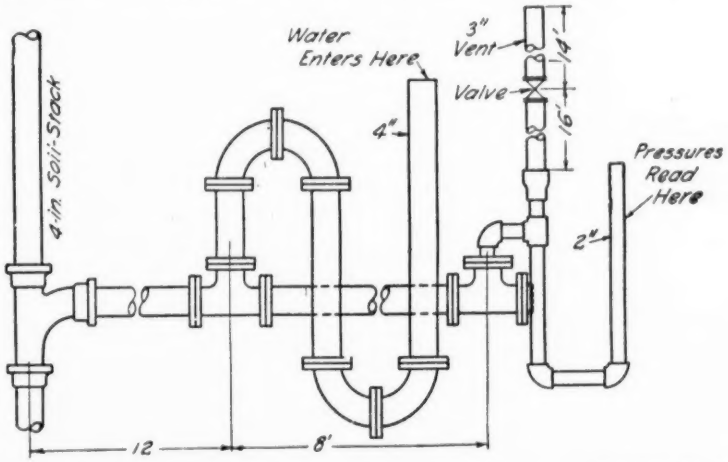

Fig. 1.—Apparatus used for study of pressures in a trap resulting from discharges into the 4-in. horizontal waste pipe to which the trap is connected. The water enters the horizontal waste pipe between the soil-stack and the trap where the pressures are measured

Summarized or representative values of the pressures observed with these different arrangements of piping and points of entrance of water to the piping, are given in Tables 3, 4 and 5, in the previous issue and in Tables 2, 3, 4 and 5 in this issue. With the pipes arranged as shown in Fig. 10 in previous issue, with the vent closed at the crown of the trap, no positive pressure was observed until the flow of water became sufficient to fill the waste pipe and to cover the outlet end of the trap at which observations were being made. The accumulation of water in the waste pipe is probably sufficiently slow to push the air into the soil-stack without producing observable pressures until the outlet end of the trap is sealed, but after this occurred, positive pressure developed in the trap.

It was concluded, as a result of the tests made on an unvented trap, that a discharge at a rate of 100 gal. per minute for 7 seconds through a 4-in. waste pipe, would cause a positive pressure of less than 2 in. of water in the trap at which observations were made. A discharge, at a slightly lower rate, would not fill the waste pipe and hence would cause no positive pressure in the trap. The positive pressure created by discharges at a rate higher than 100 gal. per minute for 7 seconds would depend on the manner in which the water backed up in the horizontal waste pipe. Negative pressure is produced in the observed trap by rates of discharge less than 100 gal. per minute. A rate of 80 gal. per minute caused a negative pressure of 0.25 ft. and smaller rates caused smaller negative pressure. A rate of 185 gal. per minute, however, caused a negative pressure of 1.6 ft. No general expression has been found for the relation between the rate of discharge and the resulting pressure in the trap of a plumbing system.

With the pipes arranged as shown in Fig. 1, with the vent closed at the crown of the trap, the positive pressure created is relatively large, but the negative pressure is so small as to be negligible for consideration in plumbing

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TWENTY CONCLUSIONS

Based on the Illinois Short Course Experiments Concerning the Actions and Effects of Plumbing-System Pressures

THE CONCLUSIONS are listed in the order in which tests have been reported. In drawing conclusions, it has been assumed that vent pipes and connections are wholly open and free from an obstruction and that the design of the plumbing system is such that partial or a complete closure through the lodgment of grease or such materials is improbable.

1. The maximum change of level of the water in a trap, resulting from the application of pressure, is approximately the same for all diameters of traps, provided the trap is sufficiently large to render negligible the effect of friction in retarding the movement of the water. The minimum diameter of trap to satisfy this condition seems to be about 1-inch. Above this size, the diameter does not appreciably affect the change of level of the water and, therefore, does not affect the pressures read.

2. For practical purposes in plumbing design, the change of level of the water in traps will be the same under the same applications of pressure, regardless of the depth of water in the trap. Therefore, the depth of water in the trap will not affect the pressure read.

3. The withdrawal of water from a trap will not weaken its resistance to the passage of air through it, provided the volume of water remaining in the trap is sufficient to fill the connection between the two legs of the trap, and to form a vertical column of a height equal to the depth of seal in that leg of the trap in which the water rises. This conclusion has no bearing on the strength of trap seals to resist self-siphonage.

4. The resistance of a trap to the passage of air through it (breaking of the seal) varies directly with depths of the seal.

5. For safety in plumbing design, it should be assumed that a water closet other than the automatic valve type which was not tested, may discharge at the rate of 50 gallons per minute for 7 seconds. This is equivalent to a total discharge of about 6 gallons. Ordinarily, a water closet will discharge a smaller amount at a slower rate.

6. With unvented traps, the pressure P varies as the five-halves power of the rate of discharge Q down the soil-stack. The relation can be expressed as $P = KQ^{5/2}$.

7. With vented traps, the pressure P varies as some constant power of the rate of discharge Q. The relation can be expressed as $P = KQ^{m}$. The value of m is dependent upon the type and capacity of the vent. The values of m vary between about one-third for very complete venting, such as might be provided by fully opening the crown of the trap and five-halves for no vent.

8. The positive pressure in unvented traps varies as the five-halves power of the height of fall of water to the point of observation. Neither positive nor negative pressures will be so produced above the point of entrance of water to the soil-stack. The negative pressure is dependent both upon the vertical distance the water falls to the point where the negative pressure is measured and on the vertical fall below this point. The greatest positive pressure is greater than the greatest negative pressure anywhere in the soil-stack.

9. The maximum rate at which water will flow down a 4-inch soil-stack without creating uncontrollable pressures in a plumbing system is high. A 4-inch soil-stack will probably take all of the water that would be delivered through it in a five-story building, a 3-inch soil-stack will probably take all of the water that would be delivered to it in a three-story residence, and a 2-inch pipe is unsuitable to be used as a soil-stack.

10. The rate at which one horizontal waste pipe of the same diameter as the soil-stack will discharge water into a soil-stack through a sanitary T without backing up in the waste pipe, may be taken to be as follows: 2-inch soil-stack, 25 gallons per minute for 7 seconds; 3-inch soil-stack, 50 gallons per minute for 7 seconds; 4-inch soil-stack, 100 gallons per minute for 7 seconds.

11. The submergence of the house drain results in a material increase in the pressures created in a plumbing system. This submergence should be avoided in design, when possible, but where unavoidable, the venting of the house drain or house sewer at a point above the highest level of water backing up into the house drain or the house sewer, will give relief.

12. The effect of the length of the house drain on the pressures in the plumbing system need not be considered in plumbing design.

13. If a house trap, either vented or unvented, is used at the end of the house drain, the pressures throughout the plumbing system are increased. It is, therefore, concluded that a house trap should not be used in a plumbing system.

14. The closure of the top of the soil-stack or the closure of vent pipes will result in such increases in pressure as to endanger the seals in traps. Soil-stacks and vent pipes should, therefore, be designed to prevent the possibility of becoming stopped up. This is in accord with good practice in plumbing design.

15. The length of a 4-inch connection between a trap and the soil-stack does not affect the pressure on the trap caused by water falling down the soil-stack for traps not more than 25 feet from the soil-stack. No tests were made on traps at a greater distance from the soil-stack.

16. The conclusions with regard to the factors affecting self-siphonage are summarized under the heading "Factors affecting self-siphonage."

17. Continuous or crown venting and loop venting are equally effective in relieving the pressures created in traps by water falling down the soil-stack.

18. Conclusions with regard to the pressures created in traps by the discharge of fixtures connected with the same horizontal waste pipe and with regard to the efficacy of different types of venting are given under the heading "The Pressures under various conditions."

19. The pressures in vented and unvented traps under different conditions are summarized in Tables 4, 5, 6 and 7 in the previous issue and in Tables 4 and 5 in this issue.

20. It is reasonably safe to use unvented traps of any style with a 2-inch depth of seal in one-story or two-story residences containing a single bathroom, and the normal number of kitchen and laundry fixtures connected to one 3-inch soil-stack, if precautions are taken as heretofore described.

TABLE 1

PRESSURES OBSERVED IN TRAPS WITH DIFFERENT SIZE CROWN VENTS

The pressures are caused by different rates of discharge falling 42 ft. down 3-in. and 4-in. soil-stacks.

Diameter Soil-Stack inches	Rate of Discharge gallons per minute	Length of Vent Pipe feet	Pressures id feet for					
			¾-in. Crown Vent	1-in. Crown Vent	1½-in. Crown Vent	2-in. Crown Vent	2½-in. Crown Vent	3-in. Crown Vent
4	67	0–5	0.10	0.07	0.04	....	....	....
4	67	25–30	0.11	0.12	0.08	....	0.03	0.03
4	67	50–60	0.15	0.13	0.08	....	0.06	0.03
4	67	90–100	0.14	0.13	0.11	0.10	0.08	0.05
4	129	0– 5	0.20	0.14	0.06	....	....	....
4	129	25–30	0.28	0.27	0.18	....	0.07	0.04
4	129	50–60	0.30	0.28	0.20	....	0.12	0.11
4	129	90–100	0.32	0.31	0.28	....	0.17	0.12
4	259	0	0.28	0.14	0.03	0.01	....	....
4	259	4– 5	0.61	0.37	0.14	0.05	0.03	....
4	259	25–30	0.95	0.70	0.32	0.24	0.11	0.08
4	259	50–60	0.93	0.73	0.50	0.34	0.20	0.16
4	259	90–100	1.04	0.84	0.57	0.45	0.36	....
3	30	0–5	0.05	0.03	....	....	....	....
3	30	20–25	0.06	0.05	0.03	0.02	....	....
3	30	45–50	0.07	0.06	0.04	0.02	....	....
3	118	0–5	0.27	0.11	....	0.01	....	....
3	118	20–25	0.39	0.23	0.07	0.03	....	....
3	118	45–50	0.46	0.33	0.12	0.06	....	....

design. The positive pressure was apparently caused by water flowing up the horizontal waste pipe and covering the outlet end of the trap in which pressure was

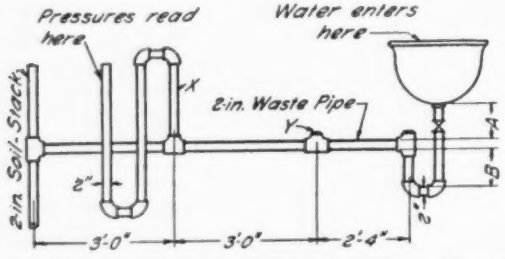

Fig. 2.—Apparatus used for study of pressures in a trap resulting from discharges into the 2-in. horizontal waste pipe to which the trap is connected. The trap is located between the soil-stack and the point of entrance of water to the waste pipe

being observed. A rate of discharge of 80 gal. per minute for 7 seconds created a positive pressure of 0.25 ft. Higher rates of discharge would probably cause higher positive pressures in a trap located where the readings of pressure were made.

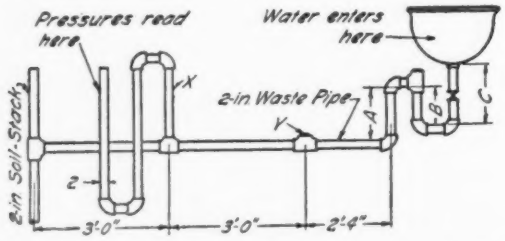

Fig. 3.—Apparatus used for study of pressures in a trap resulting from discharges into the 2-in. horizontal waste pipe to which the trap is connected. The piping arrangement is slightly different from that shown in Fig. 2

In Fig. 1, the arrangement of piping shows only one 2-in. and one 4-in. trap. Water was discharged through the 4-in. trap at rates equal to the simultaneous discharge from one to ten water closets, so that the conclusions drawn are applicable to batteries of 1 to 10 water closets connected to the same horizontal waste pipe.

The conclusions reached from the observations made on the pressures created with the pipes arranged as shown in Fig. 1, are:

(a) The discharge of one water closet will not force the air through 2-in. seals in unvented traps on fixtures connected to the same 4-in. horizontal waste pipe between the soil-stack and the discharging water closet.

(b) The discharge of one water closet will not force the air through 2-in seals in unvented traps on fixtures connected at points on the same 4-in. horizontal pipe farther away from the soil-stack than the discharging water closet.

(c) If two or more water closets are connected to the same horizontal 4-in. waste pipe, the traps on all the water closets and fixtures connected to the same waste pipe should be vented to prevent the breaking of the seal.

The effectiveness of using closed air chambers as vents was tested by closing the valve shown on the vent pipes in Fig. 1, and by placing a cap on the end of the vent pipe shown in the first article of this series. Representative values of the pressures observed under these conditions are given in Table 5 and show the ineffectiveness of closed air chambers as vents.

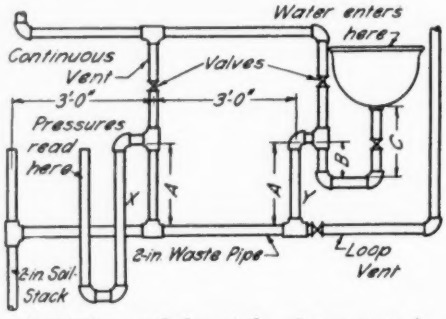

Fig. 4.—Apparatus used for study of pressures in a trap resulting from discharges into the 2-inch horizontal waste pipe to which the trap is connected. The piping arrangement differs from that shown in Fig. 3 in that the traps are vented

These values, together with other pressures observed but not recorded in the table, are in accord with the expectation that the use of closed air vents is not practicable.

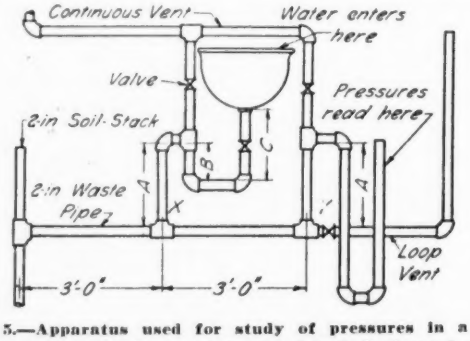

Fig. 5.—Apparatus used for study of pressures in a trap resulting from discharges into the 2-inch horizontal waste pipe to which the trap is connected. The piping arrangement differs from that shown in Fig. 4 in that the water enters the waste pipe between the soil-stack and the trap in which the pressures are measured

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TABLE 2

PRESSURES IN A 4-IN. HORIZONTAL WASTE PIPE

Pressures were caused by different rates of discharge into the waste pipe. The tests were made with the apparatus shown in Fig. 10.* The water column in the trap at which readings of pressure were taken rose slowly, as though the waste pipe were filling. No positive pressure was noticed until the water level in the waste pipe had apparently reached the outlet of the trap at which readings were being taken.

Rate of Discharge gallons per minute	Pressure in Feet of Water Observed in 2-in. Trap with 9-in. Seal						Remarks
	Positive Pressure			Negative Pressure			
	Max.	Av.	Min.	Max.	Av.	Min.	
50	0	0	0	0	0	0	
64	0	0	0	0	0	0	
185	0.32	0.27	0	0.46	0.38	0.28	Loop vented through 30 feet of 3-in. pipe.
235	0.94	0.86	0.80	0.66	0.57	0.50	
270	1.50	1.50	1.50	0.44	0.44	0.44	
29	0	0	0	0.02	0.02	0.01	
64	0	0	0	0.03	0.01	0.01	Crown vented through 30 feet of 3-in. pipe.
185	0.04	0.02	0.02	0.04	0.03	0.02	
270	0.04	0.02	0	0.04	0.03	0.02	
50	0	0	0	0.34	0.03	0	Crown vented into a closed chamber made of 16 ft. of 3-in. pipe closed at upper end.
65	0	0	0	0.50	0.07	0.01	
185	....	0.46	....	. ..	1.60	....	

* Shown in previous issue

As explained previously, a positive or negative pressure of 2-in. of water will change the volume of the confined air only about 1/200 of itself; therefore, in order that an air chamber may act effectively as a vent, it will require a volume 200 times greater than the confined air. It is not possible to state the volume of the confined air accurately, but it is evident that the volume of an air chamber must be large to act effectively as a vent. It is concluded, therefore, that the use of closed air chambers for venting traps is impracticable.

The pressures observed in traps connected to the same horizontal waste pipe were studied further with a 2-in. waste pipe and smaller rates of discharge. The piping arrangement used is shown in Fig. 2 and 3. It was expected that the lengths of the pipes marked A, B and C would have some effect on the results obtained. These lengths were, therefore, varied to learn their effect.

It was concluded from these tests that the negative pressure in the trap connected at X, for the piping arrangement shown in Fig. 2, varies with the rate of discharge, other conditions remaining unchanged, and varies with the length B but is not affected by the length A.

It was concluded also that the negative pressure in the trap, connected at X, for the piping arrangement shown in Fig. 3, varies with the rate of discharge, other conditions remaining unchanged; also with the lengths A and B, reducing as B is increased and increasing as A is increased; and is not affected by the length C.

Crown, or continuous venting, and loop venting, were studied in tests with the piping arrangements shown in Figs. 1, 4 and 5. Summarized or representative values of the pressures read in some of these tests are given in Tables 2, 3 and 4.

SOME CONCLUSIONS DRAWN

THE following conclusions were drawn from these tests:

(a) Crown, or continuous venting, is the best method of venting to safeguard the seal of traps against breaking, due to pressures created by the discharge of fixtures on the same horizontal waste pipe. Loop venting, under such conditions, is valueless.

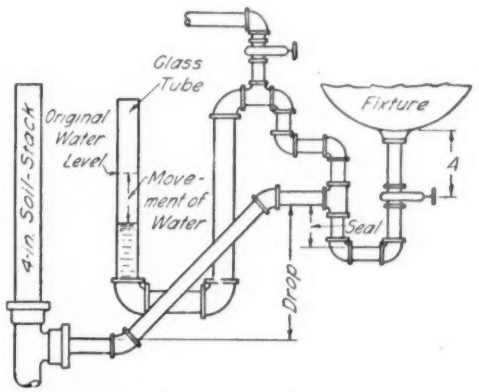


Fig. 6.—Apparatus used in self-siphonage tests of vented traps

(b) Negative pressure, in vented or unvented traps, varies with the discharge rate, with the drop, A, in the waste pipe, and the seal of the trap, B.

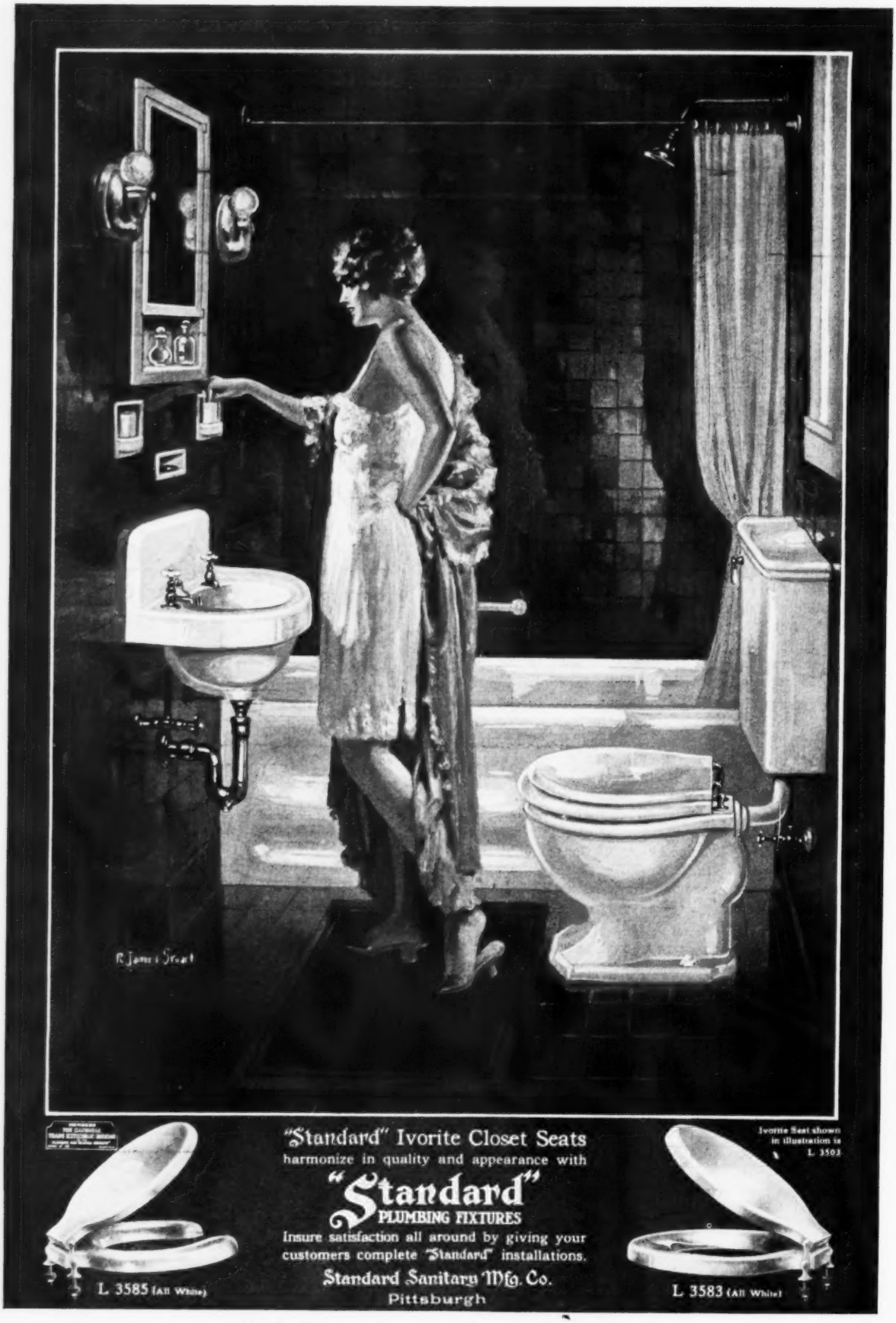
(c) Positive pressure is produced in unvented traps only when the horizontal waste pipe runs full. This was indicated by the tests in which a discharge at the rate of at least 100 gal. per minute for about 7 seconds into a 4-in. horizontal waste pipe on a slope equal to or greater than ¼ in. per foot, was required to produce a positive pressure 4 ft. from the point of entrance of water into the waste pipe, measured towards the soil-stack. Smaller rates of discharge produced no positive pressure. A discharge, at the rate of 18 gal. per minute for about 30 seconds, into a 2-in. waste pipe, on a slope of ¼ in. per foot, produced positive pressure 3 ft. from the point of entrance of water into the waste pipe, measured toward the soil-stack. The minimum rate of discharge which produced positive pressure in the 2-in waste

TABLE 3

PRESSURES IN A 4-IN. HORIZONTAL WASTE PIPE

The pressures were caused by discharges into the waste pipe. The tests were made on the apparatus shown in Fig 1

Rate of Discharge gallons per minute	Pressure in Feet of Water Observed in 2-in. Trap with 9-in. Seal						Remarks
	Positive Pressure			Negative Pressure			
	Max.	Av.	Min.	Max.	Av.	Min.	
50	0.02	0.02	0.02	0.02	0.02	0.02	Loop vented through 30 feet of 3-in. pipe.
64	0.02	0 01	0.01	0.04	0.02	0.0	
64	0.36	0.12	0.04	0.04	0.02	0.01	Continuous vented into closed chamber made of 16 ft. of 3-in. pipe closed at the upper end.
255	0 01	0.01	0.01	0.02	0.01	0.01	
255	1.0	1.0	1.0	1.5	1.5	1.5	No vent. Top of soil-stack plugged. The vacuum held momentarily and broke with a loud sucking noise.


R. James Stuart
"Standard" Ivorite Closet Seats
harmonize in quality and appearance with
"Standard"
PLUMBING FIXTURES
Insure satisfaction all around by giving your customers complete "Standard" installations.
Standard Sanitary Mfg. Co.
Pittsburgh
L 3585 (All White)
Ivorite Seat shown in illustration is L 3503
L 3583 (All White)

pipe was not determined.

(d) The positive pressure produced in unvented traps by the discharge of other fixtures on the same horizontal waste pipe, varies with the vertical distance of the discharging fixture above the waste pipe; that is the distance A in Fig. 2.

(e) The pressures, both positive and negative, produced in an unvented trap, connected at X in Figs. 2 and 3, with the fixture discharging into the horizontal waste pipe at Y, are the same as the pressures produced in an unvented trap connected at Y with the fixture discharging into the horizontal waste pipe at X.

(f) Any size of crown or continuous vent ¾ in. or larger will prevent pressures greater than 2 in. in traps arranged as shown in Figs. 4 and 5 with the following limitations: (1) If the vent is ¾ in. in diameter, it must be less than 60 ft. long. It may be longer if the diameter is greater. (2) The rate of discharge must be less than 30 gal. per minute. (3) the waste pipe must be 2 in. in diameter or smaller.

(g) The pressures created in a vented trap by the discharge of a fixture connected with the same horizontal waste pipe will be less than the pressure created in a vented trap by the same rate of discharge down a soil-stack, provided the venting is the same in each case.

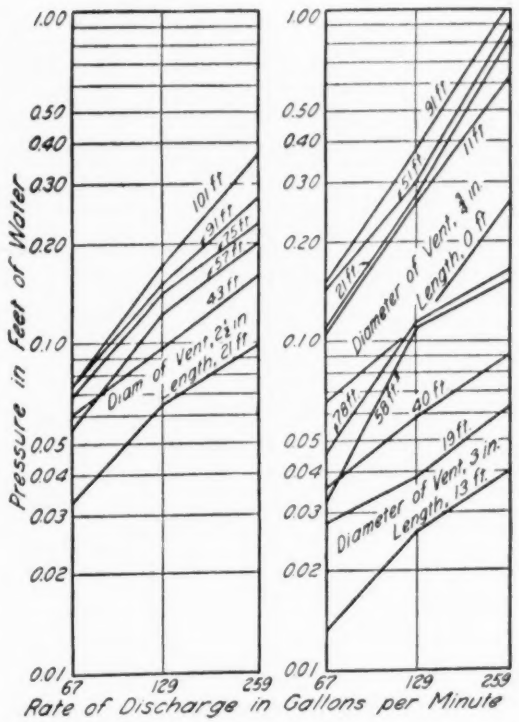


Fig. 7.—Pressures created in a plumbing system and rate of discharge down the soil-stack. The traps were vented as noted

For the third series of tests, to study the pressures created in vented traps by self-siphonage, the apparatus used is shown in Fig. 6. In these tests, the rates of discharge from the fixtures varied between 10 and 45 gal. per minute for about 30 seconds. Vent pipes ¾ in. and 1½ in. in diameter and in lengths up to 6 ft. were used. Summarized or representative values are given in Table 4 in the previous issue.

It was concluded from these tests that a crown or continuous vent pipe ¾ in. in diameter will prevent the breaking of the seal of a trap by self-siphonage, provided the drop is not longer than 4 ft. and the rate of discharge is not more than about 18 gal. per minute.

FINDING THE PROPER VENT CAPACITY

FROM the study of the pressures created in vented traps with various arrangements of piping and rates of discharge, it was concluded that a vent pipe having sufficient capacity to prevent the breaking of the seal in a trap by water falling down a soil-stack, will have sufficient capacity to prevent the breaking of the seal in the trap under any conditions. Therefore, if vent capacity is provided sufficiently to relieve the pressures resulting from the water falling down the soil-stack, the pressures resulting from any other

TABLE 4

PRESSURES RESULTING FROM THE USE OF DIFFERENT TYPES AND CAPACITIES OF VENTS AND DIFFERENT RATES OF DISCHARGE IN THE SELF-SIPHONAGE APPARATUS SHOWN IN FIGS. 4 AND 5

Pressures are given in feet of water. The vent pipes were 1 in. in diameter except as noted. The drop was 2 ft., the seal was 0.38 ft. and the length of the discharge pipe between the fixture and the trap was 1½ ft. The discharge from the fixture lasted from 6 to 12 seconds. The readings were taken at the moment the fixture became empty. The waste pipe ran full and the trap seal did not break.

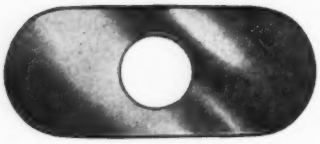
Discharge gallons per minute	Type of Vent	Length of Vent feet	Piping Arranged as Shown in Fig. 4						Piping Arranged as Shown in Fig. 5					
			Positive Pressure			Negative Pressure			Positive Pressure			Negative Pressure		
			Max.	Av.	Min.	Max.	Av.	Min.	Max.	Av.	Min.	Max.	Av.	Min.
30	Crown	50		Negligible			Negligible		0.14	0.11	0.05	0.07	0.06	0.04
18	Crown	50		Negligible			Negligible		0.03	0.01	0	0.02	0.02	0.01
30	Crown	30	0	0	0	0.02	0.02	0.02	0.12	0.10	0.06	0.06	0.05	0.04
18	Crown	30	0.04	0.04	0.03	0.03	0.03	0.02	0	0	0	0.02	0.02	0.02
30	Crown	17	....	0	....	....	0	....	0.04	0.04	0.03	0.03	0.03	0.02
18	Crown	17	....	....	....	....	....	....	0	0	0	....	0.01	....
30	Loop	52	0.90	0.84	0.80	0.34	0.30	0.26	1.2	1.10	0.86	0.42	0.36	0.32
18	Loop	52	0.32	0.31	0.30	0.34	0.30	0.28	0.26	0.23	0.20	0.36	0.30	0.24
30	Loop	32	0.86	0.83	0.80	0.32	0.29	0.24	1.18	1.10	1.02	0.44	0.38	0.30
18	Loop	32	0.38	0.33	0.28	0.34	0.30	0.22	0.20	0.18	0.16	0.30	0.26	0.20
30	Loop	31	....	....	....	....	....	....	1.18	1.15	1.12	0.22	0.19	0.16
18	Loop	31	....	....	....	....	....	....	0.22	0.19	0.16	0.24	0.22	0.20
30	Loop	21	0.90	0.82	0.78	0.38	0.32	0.24	0.40	0.13	0.13	0.30	0.25	0.20
18	Loop	21	0.28	0.25	0.20	0.36	0.31	0.24	0.38	0.35	0.28	0.36	0.29	0.26
30	Loop	15½	0.84	0.82	0.80	0.40	0.35	0.32	....	....	....	....	....	....
18	Loop	15½	0.36	0.33	0.28	0.40	0.33	0.30	....	....	....	....	....	....
30	Loop	4½	0.88	0.86	0.84	0.32	0.31	0.28	....	....	....	....	....	....
30	Loop*	59	0.82	0.78	0.74	0.40	0.34	0.30	....	....	....	....	....	....
30	Loop*	5	0.80	0.78	0.76	0.38	0.32	0.30	....	....	....	....	....	....
30	Crown*	60	....	....	....	....	....	....	0.06	0.04	0	0.13	0.11	0.08
30	Crown*	30	....	....	....	....	....	....	0.05	0.04	0.03	0.08	0.07	0.05
30	Crown*	0	....	....	....	....	....	....		Negligible			Negligible	
30	No vent	..	....	....	....	0.58	0.51	0.42	0.86	0.84	0.80	0.56	0.40	0.46
18	No vent	..	....	....	....	0.55	0.45	0.28	....	....	....	....	....	....

*The diameter of the vent pipe used in this case was ¾ in.

26691—2½ in. iron screw (brass plate), slotted.
26775—2½-in. brass screw, slotted.
33684—2½ in. iron screw (brass plate), not slotted
33685—2½-in. brass screw, not slotted.
33615—3-in. brass screw, slotted.
34382—3-in. iron screw (brass plate), slotted.
Head—Brass—Polished Nickel.

6977—Nickel-plated
9842-18831 (heavy) Nickel-plated
7218-34913 (heavy)
17474 (extra heavy)
Nickel-plated

6977—Nickel-plated
9842-18831 (heavy) Nickel-plated
7218-34913 (heavy)
17474 (extra heavy)
Nickel-plated



6977—Nickel-plated
9842-18831 (heavy) Nickel-plated
7218-34913 (heavy)
17474 (extra heavy)
Nickel-plated

33033—1½inch
33252—1¾inch
33008—2¼inch
Wrought Brass Head—Polished Nickel

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THE Waterbury line of closet screws, bolts and washers occupies five entire pages of our catalog. Yet the items there featured are merely a few of our most popular numbers of this class.

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TABLE 5

PRESSURES OBSERVED IN TRAPS CROWN VENTED INTO CLOSED AIR CHAMBERS

The pressures are caused by different rates of discharge falling 42 ft. down a 4-in soil-stack.

Discharge gallons per minute	Length of Air Chamber feet	Pressures in Feet for Air Chambers		Pressures in Feet with No Vent
		3-in. Diam.	¾-in. Diam.	
67	0–5	....	....	0.15
	25–30	0.16	0.14	
	50–60	0.16	0.14	
	90–100	....	0.15	
129	0–5	....	....	0 35
	25–30	0.38	0.36	
	50–60	0.41	0.39	
	90–100	0.34	0.36	

condition in the plumbing system will be relieved. The study of proper vent capacity was based on the observations of pressure in traps resulting from water falling down the soil-stack.

In formulating a method for the determination of proper vent capacity, it has been assumed that the top of the soil-stack will not become closed, the house drain will not become submerged, no house trap will be used and that solid matter will be mixed with the discharge.

RELATION BETWEEN MAXIMUM AND AVERAGE PRESSURE

THE greater the pressure on a trap, the greater the movement of water in the trap. This statement is in accord with the description of pressure heretofore described. The greatest, or the maximum, pressure is, therefore, the pressure to be prevented. In most of the tests so far discussed, the pressures reported represent only the average of a number of observed pressures. It is, therefore, desirable to find a relation between the maximum and the average pressures in order that the maximum pressures may be studied under all the conditions tested. In some tests, the maximum and the minimum pressures were observed and the average pressures were computed, and all were recorded as in Tables 6 and 7 in previous issue. From these values and from other values not recorded in these tables, it was found that:

(a) For rates of flow equal to or greater than the simultaneous discharge of two or more water closets, the ratio of maximum pressure, with solid matter present, to the average pressure without solid matter, is in no case as great as two.

(b) For rates of flow equal to or less than the discharge from one water closet falling 42 ft. down a 4-in. soil-stack, the ratio of the maximum pressure, with solid matter present, to the average pressure without solid matter, is greater than 2, but the maximum pressure with solid matter present, is only slightly greater than 2 in.

(c) For a rate of flow of 30 gal. per minute, falling 42 ft. down a 3-in. soil-stack, the ratio of the maximum pressure with solid matter present to the average pressure without solid matter is about 4½, and the maximum pressure with solid matter present is 0.33 ft., equal to 4 in.

(d) With solid matter present, the ratio of the maximum pressure to the average pressure is in no case greater than 2½, without solid matter, the ratio of the maximum pressure to the average pressure is in no case as great as 2.

It is, therefore, concluded, if traps with a seal 2 in. in depth or more are used, that a vent capacity sufficient to prevent pressures greater than double the average pressure observed in any series of tests made

TABLE 6

MAXIMUM POSITIVE PRESSURES WHICH MAY BE CREATED IN CROWN VENTED TRAPS BY WATER FALLING 42 FT. DOWN A 4-IN. SOIL-STACK

The values in this table have been computed by doubling the computed average pressures.

Diameter of Crown Vent inches	Length of Crown Vent feet	Rate of Discharge—gallons per minute						
		30	50	100	150	200	250	300
		Pressure in Feet of Water						
3	10	0.02	0.04	0.05	0.06	0.07	0.08	0.10
3	30	0.03	0.05	0.08	0.10	0.14	0.18	0.20
3	50	0.04	0.06	0.12	0.16	0.20	0.24	0.28
3	75	0.05	0.07	0.14	0.20	0.26	0.32	0.38
3	100	0.06	0.08	0.16	0.24	0.30	0.36	0.42
2½	10	0.03	0.04	0.08	0.12	0.16	0.18	0.22
2½	30	0.04	0.07	0.14	0.22	0.28	0.36	0.42
2½	50	0.05	0.08	0.18	0.28	0.38	0.48	0.56
2½	75	0.06	0.11	0.24	0.36	0.50	0.62	0.74
2½	100	0.07	0.12	0.28	0.42	0.56	0.72	0.88
2	10	0.04	0.06	0.10	0.14	0.18	0.22	0.24
2	30	0.05	0.10	0.18	0.28	0.38	0.44	0.52
2	50	0.06	0.12	0.24	0.36	0.50	0.60	0.74
2	75	0.07	0.14	0.30	0.44	0.60	0.78	0.96
2	100	0.08	0.16	0.34	0.52	0.70	0.96	1.06
1½	10	0.06	0.08	0.16	0.12	0.34	0.38	0.46
1½	30	0.07	0.12	0.26	0.38	0.50	0.64	0.76
1½	50	0.08	0.14	0.30	0.46	0.64	0.80	0.96
1½	75	0.09	0.16	0.36	0.56	0.76	0.96	1.18
1½	100	0.10	0.18	0.40	0.64	0.86	1.10	1.34
1	10	0.09	0.16	0.34	0.52	0.70	0.90	1.08
1	30	0.10	0.18	0.42	0.66	0.92	1.18	1.46
1	50	0.11	0.20	0.46	0.76	1.06	1.36	1.70
1	75	0.12	0.22	0.52	0.84	1.20	1.58	1.98
1	100	0.13	0.24	0.54	0.90	1.30	1.70	2.06
¾	10	0.10	0.20	0.42	0.68	0.94	1.20	1.48
¾	30	0.14	0.26	0.58	0.94	1.30	1.70	2.10
¾	50	0.16	0.30	0.68	1.10	1.54	2.00	2.48
¾	75	0.18	0.34	0.76	1.24	1.74	2.24	2.84
¾	100	0.20	0.36	0.82	1.34	1.90	2.48	3.10

TABLE 7

MAXIMUM POSITIVE PRESSURES WHICH MAY BE CREATED IN CROWN VENTED TRAPS BY WATER FALLING 42 FT. DOWN A 3-IN. SOIL-STACK

The values in this table have been computed by doubling the computed average pressures.

Diameter of Crown Vent inches	Length of Crown Vent feet	Rate of Discharge—gallons per minute				
		30	60	90	120	150
		Pressures in Feet of Water				
2	10	0 03	0 04	0 06	0 08	0 10
2	30	0 05	0 08	0 12	0 16	0 18
2	50	0 06	0 12	0 16	0 22	0 26
1½	10	0 04	0 06	0 08	0 10	0 12
1½	30	0 06	0 12	0 16	0 20	0 26
1½	50	0 08	0 14	0 22	0 30	0 38
1	10	0 08	0 20	0 34	0 48	0 60
1	30	0 11	0 30	0 52	0 76	0 94
1	50	0 12	0 34	0 62	0 92	1 16
¾	10	0 10	0 24	0 38	0 56	0 74
¾	30	0 12	0 30	0 54	0 78	1 06
¾	50	0 14	0 36	0 64	0 96	1 32
No Vent		0 16	0 50	1 10	2 5	3 80

without solid matter mixed with the discharge, will be needed to prevent the breaking of the seal of a trap, with the following exceptions: When the rate of discharge is below 50 gal. per minute, falling more than 30 ft. down a 3-in. soil-stack, a vent capacity sufficient to prevent pressures greater than 4 times the average pressure observed in any series of tests made without solid matter, mixed with the discharge, will be needed to prevent the breaking of the seal of the trap.

These conclusions with regard to the requisite capacity of vents to prevent excessive pressures caused by solid matter mixed with the discharge are safe because the character of the solid matter used in these tests was such as to create greater pressures than would probably be caused by the solid matter ordinarily mixed with the discharges from plumbing fixtures.

RELATION BETWEEN RATES OF DISCHARGE AND PRESSURE IN A TRAP FOR DIFFERENT VENT CAPACITIES

THE pressures recorded in Table 1 and other pressures observed but not here recorded were plotted as ordinates in Fig. 7 with the corresponding rates of discharges as abscissas. Points for the same length and diameter of vent pipe were connected by a line. The lines thus formed are neither straight nor parallel. As only three points are available for each line, and the pressure readings are accurate only to .05 ft., the degree of accuracy of the location of the lines is not high. So many lines were drawn, however, that the general tendency of their direction could be determined and conclusions could be drawn as to the relation between discharge and pressure for any particular vent. These conclusions have been used in computing the probable maximum pressure.

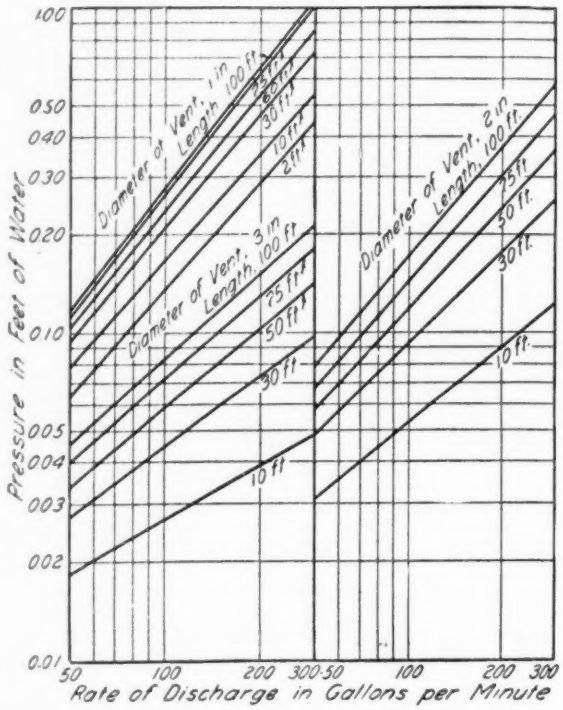


Fig. 8.—Pressures created in a plumbing system and rate of discharge down the soil-stack. The traps were vented as noted. The pressures have been derived by the use of the values given in Fig. 7. The soil-stack was 4 inches in diameter and the height of fall of water 42 ft.

TABLE 8

FACTORS BY WHICH THE PRESSURES IN TABLES 6 AND 7 MUST BE MULTIPLIED TO FIND THE PRESSURES FOR OTHER HEIGHTS OF FALL IN A SOIL-STACK ABOVE THE POINT WHERE THE PRESSURE IS TO BE MEASURED

Height of Fall feet	Factor
40	0.88
35	0.63
30	0.43
25	0.27
20	0.16
15	0.076
10	0.028

PROBABLE MAXIMUM POSITIVE PRESSURE IN VENTED TRAPS

A SECOND diagram, Fig. 8, similar to Fig. 7, was drawn, except that the lines were made straight. The lines were straightened by plotting on logarithmic cross-section paper, a series of points for each length and diameter of vent pipe. The abscissas of these points were rates of discharge and the ordinates were corresponding pressures. Straight lines were drawn approximately through these points, and lines such as those in Fig. 8 were produced. The slope and position of such lines were not always consistent, however. These were made consistent by the following process: First, points were plotted on logarithmic cross-section paper for each rate of discharge and diameter of vent pipe, the abscissas of which were the length of the vent pipe and the ordinates the corresponding pressures. Secondly, straight lines were drawn approximately through these points; and finally the position and slope of the original lines were changed to be consistent with new lines, and these new lines are shown in Fig. 8. The plotting of the points on logarithmic cross-section paper and the drawing of straight lines through these points is consistent with the tendencies of the pressures and rates of discharge observed in the tests as shown in the Figures 8, 9, 10 and 12, shown in the second article of

TABLE 9

MAXIMUM POSITIVE PRESSURES WHICH MAY BE CREATED IN CROWN VENTED TRAPS BY WATER FALLING 42 FT. DOWN A 3-IN. SOIL-STACK

The values in this table have been computed by doubling the computed average pressures.

Diameter of Crown Vent inches	Length of Crown Vent feet	Rate of Discharge—gallons per minute				
		30	60	90	120	150
		Pressures in Feet of Water				
2	10	0.03	0.04	0.06	0.08	0.10
2	30	0.05	0.08	0.12	0.16	0.18
2	50	0.06	0.12	0.16	0.22	0.26
1½	10	0.04	0.06	0.08	0.10	0.12
1½	30	0.06	0.12	0.16	0.20	0.26
1½	50	0.08	0.14	0.22	0.30	0.38
1	10	0.08	0.20	0.34	0.48	0.60
1	30	0.11	0.30	0.52	0.76	0.94
1	50	0.12	0.34	0.62	0.92	1.16
¾	10	0.10	0.24	0.38	0.56	0.74
¾	30	0.12	0.30	0.54	0.78	1.06
¾	50	0.14	0.36	0.64	0.96	1.32
No Vent		0.16	0.50	1.10	2.5	3.80

Adopted as Standard by Thousands

THERE is nothing extraordinary about this "McR" Compression Bibb, yet the fact remains that it is enough better than the ordinary variety to make it the preference of several thousand master plumbers.

Of course, its being made by one of the oldest brass manufacturers in the country, who know just how a faucet should be made to give the maximum service and who make it just that way, undoubtedly accounts in a large measure for its popularity.

If you have been ordering your brass goods without specifying the make, call for "McR" next time and note the difference. The chances are you'll standardize on "McR" too.

The McRAE & ROBERTS CO.,
DETROIT, MICHIGAN

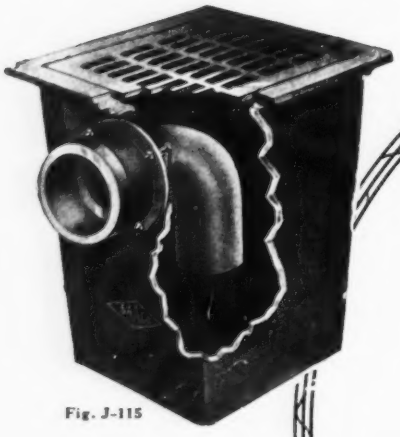


Fig. J-115

"SAACO" SAND TRAP

THE SAACO SAND TRAP does the work of a regular drain and trap and, in addition, catches and holds the sand and solids, preventing them from entering and clogging the drainage system.

A strictly sanitary fixture. Trap always maintains a seal, and when filled with sediment, can easily be cleaned.

Especially desirable for Garages, Carriage Houses, Bath Houses, Stables and Dairies. Made for concrete or wood floors. Dimensions 14 x 14 x 18 inches and 14 x 14 x 14 inches.

THE SAACO RE-SEALING TRAP for Sinks, Lavatories, Laundry Tubs, etc.

Depth of seal not over four inches. Meets demand for a deep seal trap and to offer a greater resistance to back pressure.

So constructed that syphonage from capillary attraction is reduced to the minimum.

Cleanout recessed up from bottom—no sediment pocket below inlet. Complies with all requirements of building codes.

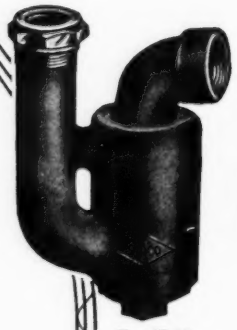


Fig. K-13

Fig. K-14

"SAACO" ANTI-SYPHON TRAP

Sanitary Company of America

Main Office:
LINFIELD, PA.

Write for prices and details.

this series. The values in Table 6 and similar tables, were computed from Fig. 8 in previous issue, by doubling the pressures indicated by lines in the figure, in order that the maximum pressures to be expected might be recorded in accordance with the conclusions in the paragraphs under the heading "Relation between maximum and average pressures."

The values in Table 6 indicate the maximum positive pressures which may be expected in traps with water alone falling 42 ft. down a 4-in. soil-stack. The figures in Table 7 indicate the maximum positive pressures which may be expected in traps with water alone falling 42 ft. down a 3-in. soil-stack. In order that the positive pressures created by water falling a shorter distance down a soil-stack might be computed, Table 8 was prepared. This shows the factors by which the figures in Tables 6 and 7 must be multiplied for other heights of fall in the soil-stack. The factors in Table 8 were computed from the relation that the pressures vary as the five-halves power of the height of fall down the soil-stack.

FINDING THE PROPER VENT CAPACITY

IN designing plumbing equipment so as to avoid excessive pressures in traps, the designer will know the maximum rate of discharge down the soil-stack, the height of fall of water from the highest inlet to the base of the soil-stack, the depth of seal in the trap, the type of vent, and either the diameter or the length of the vent pipe. If the length of vent pipe is known, it remains to determine the diameter; if the diameter is known, it remains to determine the greatest length which may be used.

To find the maximum length of vent pipe which may be used to prevent the breaking of a 2-in seal in a trap connected to the base of the soil-stack, proceed as follows:

(1) Consult Table 8 and find the factor corresponding to the greatest height of fall of water in the soil-stack for which the design is being made.

(2) Divide the assumed depth of seal by this factor.

(3) Consult Tables 6 and 7 in the group of values corresponding to the diameter of vent pipe, fixed by the designer and in the column corresponding to the maximum rate of discharge fixed by the designer, find the value computed in the second step. The line of the table in which this pressure is found will give the maximum length of vent pipe which may be used.

For example, let it be assumed that the maximum rate of discharge in a plumbing system may be equivalent to three water closets discharging simultaneously 150 gal. per minute, and it is desired to determine the permissible length of a ¾-in. crown vent pipe to use on a trap in the basement which discharges into a 4-in. soil-stack 20 ft. below the point of entrance of the discharge from the highest horizontal waste pipe connected to the soil-stack, so that a trap with a 2-in. seal can be used. The procedure will be as follows:

(1) In Table 8, the factor for 20 ft. is found to be 0.16. Divide 0.17, the depth of seal, by 0.16, and the quotient is 1.06.

(2) Consult Table 6 in the group of values corresponding to ¾-in. vent pipe. In the column headed 150 gal. per minute, the value of 1.06 is seen to lie between 0.94 and 1.10, which allows a maximum length of vent pipe of about 45 ft. It is to be noted that the size of vent selected was based on the maximum positive pressure in the soil-stack. In the tests, it was found that the greatest positive pressure was always larger than the greatest negative pressure anywhere in the soil-stack.

VENT CAPACITY FOR A RESIDENCE WITH ONE BATHROOM

IT will be assumed that the type of residence under consideration will contain a single bathroom on the second floor, together with the ordinary number of bathroom, kitchen and laundry fixtures. The greatest height of fall of water in the soil-stack will be assumed as 20 ft., and it will be assumed that a 3-in. soil-stack is to be used.

In this case, let it be assumed that the smallest depth of seal in any trap is to be 2 in., and that it is required to find the greatest length of ¾-in. vent pipe which may be used. Since the maximum height of fall of water in the soil-stack may be 20 ft., the factor in Table 8, as before, is 0.16 and the maximum permissible pressure in Table 6 is 1.06 ft., but since the rate of discharge is low and a 3-in. soil-stack is to be used, in accordance with conclusions heretofore made, the permissible maximum pressure should be only one-half of this or 0.53 ft. (The pressure actually observed with a fall of 42 ft. in a 3-in. soil-stack was 0.33 ft.)

Consulting the table of the group of values corresponding to a ¾-in. vent pipe in the column headed 60 gal. per minute, which is slightly greater than the maximum rate of discharge from one water closet, it is found that even more than 50 ft. of ¾-in. vent pipe may be used. Dropping down to the next line in the table, it is seen that even without the use of a vent pipe, the maximum permissible change of the water level in the trap will not be exceeded. It is thus evident that, under the conditions assumed, no vent pipe is needed. If no vent pipe is used, however, it is possible that the trap may siphon itself, and therefore a vent may be necessary to prevent the destruction of the seal by self-siphonage.

CONDITIONS SUITABLE FOR THE USE OF A 3-IN. SOIL-STACK AND NO VENT

IN the conditions given in the preceding example, it is evident that a 3-in. soil-stack can be used and that no vent pipes are necessary except to prevent the destruction of the seal by self-siphonage.

It can be stated in general terms, therefore, that if proper precautions are taken to prevent the destruction of the seal of a trap by self-siphonage, the submergence of the outlet to the house drain, the stoppage of the top of the soil-stack, and also to prevent the pressures created by the discharge of traps into a horizontal waste pipe from breaking the seal in other traps connected to the same waste pipe, it is reasonably safe to use unvented traps of any style, with a 2-in. depth of seal, in one story or two story residences containing a single bathroom and the normal number of kitchen and laundry fixtures connected to one 3-in. soil-stack.

There's profit in "United States" Enameled Fixtures

United States Sanitary Mfg. Co.

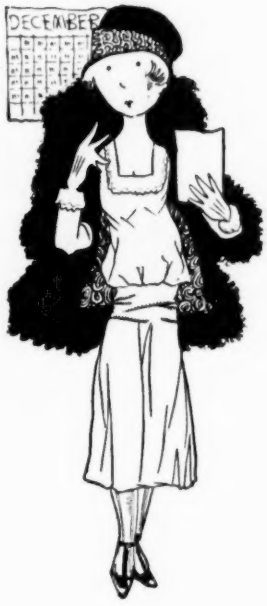
NEW YORK CHICAGO **PITTSBURGH** PHILADELPHIA BOSTON

MATERIAL OF QUALITY, and SKILLED WORKMANSHIP is combined in the manufacture of the following:

BATH TUBS
SHOWER RECEPTORS
DRINKING FOUNTAINS
CLOSET TANKS
URINALS
LAVATORIES
KITCHEN SINKS
DRAIN BOARDS
SLOP SINKS
WASH SINKS
SINK AND TRAY COMBINATIONS
LAUNDRY TRAYS

Advertising Editorial

A NEW ONE EVERY WEEK—No. 157



That Christmas List

MOST of us are working overtime these days trying to think of unusual gifts. Everything the stores offer seems just the same as last year, and the year before.

Wouldn't it be unusual to drop into the plumber's to see what he has to offer? A gift from his shop would be "different," wouldn't it?

And it would meet completely the common sense idea that has grown in Christmas buying since the war—it would be useful and practical.

For Christmas, give your family one of the many conveniences offered by this up-to-the-minute plumbing and heating establishment. It will contribute for years to their health and happiness.

Make Friends—*Now*

THERE isn't any time in the year when it's as easy to make friends as during the period when the Christmas buying is being done. People are in the mood to buy, and they're on the lookout for instructive suggestions.

If you haven't been using the Advertising Editorials up to now, give them a whirl. It isn't alone the immediate sales that you'll make which counts, it's the fact that every new customer you gain now means greater call on your service during the year.

The cost of the Editorials is small. We furnish twelve illustrations for $4.20.

If you use the Editorials now, you'll continue to use them. It's the keeping everlastingly at it that makes advertising pay, that lowers costs and increases profits by bringing in more business.

America enjoys more comforts and conveniences than any country in the world because advertising has helped to bring many things within the reach of the average family. It's the great educational force that has benefited both the buyer and the seller.

Remember that the merchandise you offer is advertised in magazines of national circulation. You identify yourself with that advertising when you advertise locally.

Make friends now by using the Editorials. You'll help make better standards in your community and enjoy better business.

Typewrite the following, sign it and send it to the editor of your local newspaper. Send him one of them every week. Keep it up! Use these Humanisms. Persistence wins.

War

War is a great breeder of pestilence, because it takes men away from the ordinary habits of cleanliness.

• • •

You'll remember that during the Spanish-American war it was said that more men died from disease than from bullets.

• • •

Wherever great masses of people are gathered together, the price of health is constant vigilance.

• • •

Life in the great cities of the present would produce the pestilences of war, if it were not for the modern science of sanitation.

• • •

Every public-spirited citizen owes it to his community to maintain sanitary conditions about his home.

• • •

And everyone owes it to his health and his family to supply one of the simplest yet most powerful aids to good health—the bath.

• • •

Communities where there is lack of bathing facilities in the homes of the people should establish public baths. Chicago maintains twenty-three public baths. The windy city is a healthful place in which to live.

Adlet

ONE A WEEK—NO. 16

IF you really cannot afford to use large space in the newspapers, then make your small space more effective by using the Adlets printed on this page each week.

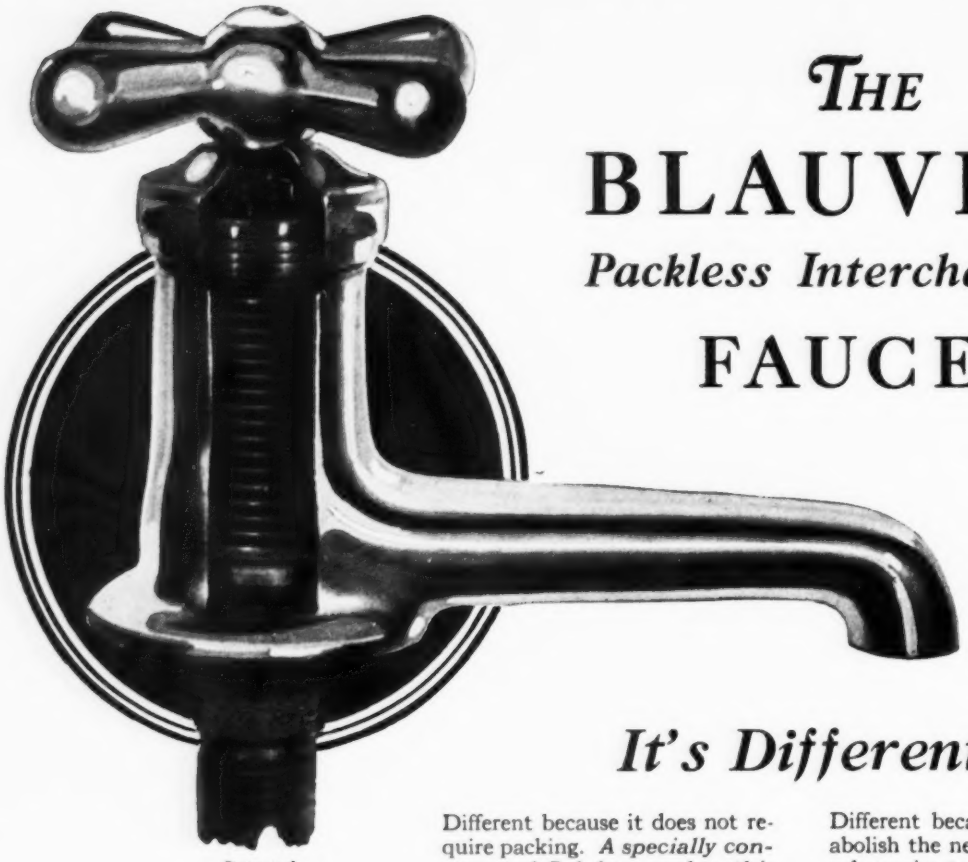
Each one of them presents one merchandising idea, which is much better than merely filling the space with your name. You can accomplish more by including a short selling talk on some current and important topic.

In time, by the consistent use of these Adlets, you will find them getting across and making people talk about them.

Just copy the Adlet below, add your name, address and telephone and give it to your paper.

Health Insurance

Even heat is health insurance for your family. If your heating plant is not operating efficiently you are opening the door to colds and taking a chance with pneumonia. You're losing money, too, because of fuel wast Let us overhaul your heating plant now. Just phone for prompt service.



THE BLAUVELT
Packless Interchangeable
FAUCET

Patented
DEC. 25, 1923

No. 100

Body of Faucet cut away showing specially constructed Sylphon

It's Different

Different because it does not require packing. *A specially constructed Sylphon makes this possible.* This Sylphon will stand expansion and contraction, to practically an unlimited extent, in either hot or cold water. Severe tests have proven this.

Different also because the valve action reduces wear on the washer, valve disc and seat to an absolute minimum. This is accomplished by the use of a *non-rotating valve.*

Different because in addition to the non-rotating valve feature the washer is composed of a special long wearing compound.

Different because these features abolish the necessity for periodical repairs to keep faucet from leaking.

Different because handle does not raise when turning on water.

Different because the faucet when installed can be made compression or self-closing by simply changing the cap. This is the interchangeable feature typical only of Blauvelt Packless Interchangeable Faucets.

Different because you can safely recommend it to your clients as an efficient, economical faucet of handsome design, fine finish and of the highest standard of workmanship.

The Blauvelt Packless Interchangeable Faucet is made in single and double styles in both compression and self-closing types for basin and sink installations.

The self-closing and compression caps are interchangeable on the same faucet body.

A folder describing this faucet in detail will be sent upon request.

The F. N. Du Bois Company, Inc.

243-249 Ninth Avenue **New York**

The Questions and Answers Department is open to all readers. Here their questions are answered—their problems solved. And, what is more, this department is an open forum, where readers may discuss plumbing and heating subjects. Don't hesitate to ask questions about the things you want to know, and don't fail to send in your comments and criticisms of questions that have been answered. While all questions are answered by men who are expert in their particular lines, your experiences may help a fellow craftsman who is in need of information. This department is for the craft. Use it freely. There are many ways to untie knotty problems.

REGARDING COMBINATION RANGE BOILER CONNECTIONS

Editor, "Domestic Engineering":—I will appreciate it greatly if you will give me the correct way of connecting boilers and range and tank heater as shown in Fig. 1. The idea is to use them independently of one another, or both at the same time.

Indiana. C. E. W.

Correspondent submits sketch, Fig. 1, showing a range and boiler on first floor and a heater and boiler in basement, and desires to know how to use each unit separately and together, or, to use basement heater on both boilers without using range fire when not desired. This is a simple matter of valving off the different units as shown in Fig. 2. When boiler on first floor is to be used only, the valve No. 2 on cold water supply to basement boiler must be shut off.

When hot water faucet is opened, hot water only will flow from upper boiler for the simple reason that direct

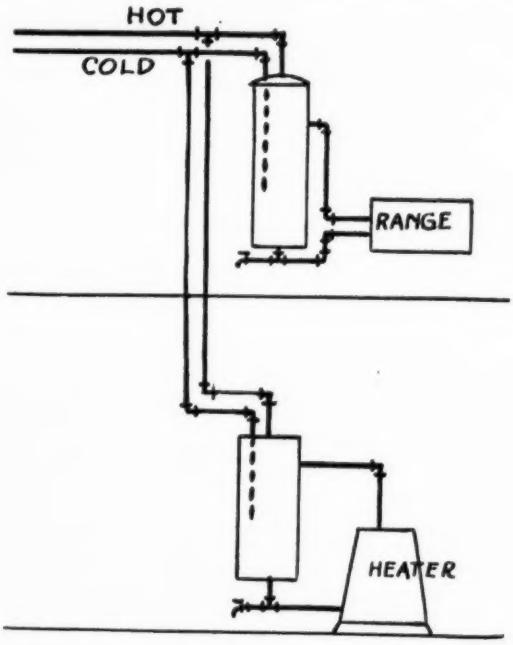


Fig. 1

pressure is shut off from lower boiler and cold water from said boiler cannot flow from same hot supply to fixtures.

When basement boiler is to be used only, valve No. 1 on cold supply to first floor boiler must be shut off, then the same conditions exist as in the first case. When both boilers and heaters are to be used, valves Nos. 1 and 2 must be open. Valve No. 3 is always closed except when

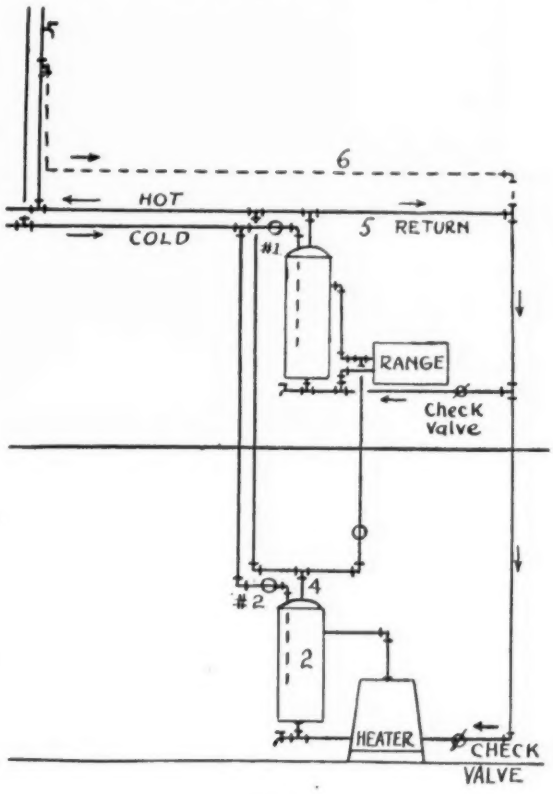


Fig. 2

heater in basement is to be used to heat both boilers, when range fire is not desired. In this case valves Nos. 2 and 3 must be open with No. 1 closed and connection shown in line with valve No. 3 is necessary, i. e., hot water line from top of basement boiler must branch off to right and left from tee, as shown in Fig. 2, with nipples of equal length so that hot water will divide equally. If centers from tee to ells are not equally distant, the hot water will follow the line of least resistance, and if that be to the riser which leads to the horizontal hot line above first floor boiler, said boiler will not get hot.

The tee at No. 4 should be ¾ inch x ¾ inch x 1 inch on the side with the nipple from boiler to tee to be 1 inch. All pipes from heaters to sides of boilers should be 1 inch and should have an appreciable rise from heaters to boilers. If possible use forty-five degree ells instead of ninety

Quality!

MIDLAND

Midland Fla

The Angle Fl

We furnish A

The size is ca
ping and stoc

Qu

Midland Galvanized Sure Grip (Patents Pending) Roof Flashings

Angle Flashings will fit any pitch of roof. The size is stamped on each flashing, which eliminates confusion in shipping and stock rooms.

The base or sheet is manufactured from **ARMCO** Galvanized Iron.

Sheet is extra large, allowing 6 inches for shingle room on upper side.

The Neck is made from Lead, cast right onto the galvanized sheet. No rolled, crimped or soldered joints.

Packed 1 dozen to the carton, properly labeled to show contents.

Made in all sizes, $1\frac{1}{4}$ to 6 inches.

Midland Brass Ferrules

Midland Ferrules are manufactured in both Red and Yellow Brass in twenty-six sizes and weights. A rigid inspection system prevents the possibility of sand and blow holes. The walls of our ferrules are uniform the entire length. The name "Midland" is cast on all of our ferrules, which is our guarantee and your protection.

MIDLAND METAL MFG. CO.

KANSAS CITY -:- MISSOURI

D LL LEAD—ONE ECE—PATENTED ROOF FLASHINGS

d Flas gs are manufactured in both Angle and Flat pattern.

gle Fla ing will fit any pitch of roof.

nish A le Flashings on orders where style is not specified.

is cas on each flashing, which eliminates confusion in shipd stock ooms.

Made in all sizes $1\frac{1}{4}$ to 6 inches.

ality!

SAVE—

LABOR

TIME

MONEY

by specifying "Midland" Roof Flashings and Ferrules.

The "Midland" Line is sold exclusively through the plumbing supply jobbers.

Quality!

sizes
blow
nd"
tion.

degree ells, as it makes for quicker circulation with less fuel, hence a better job all round. Railroad or ground joint unions should also be used at these connections instead of the common gasket unions. All other lines may be ¾ inch.

Some plumbers would place a valve on the vertical hot line from the basement boiler to horizontal hot line above first floor boiler when basement heater is heating both boilers, but that is not necessary. In fact, we do not encourage valving hot lines from range boilers at any time, but when relief valves are in the system, danger of explosion is reduced to the minimum.

Where there are no check valves on main cold supply lines to house or, in other words, from street to boilers, there is no danger of explosion, as the excess pressure (caused by a prolonged vigorous fire) on boilers and pipes would find exit to the main in street.

A circulating return line should be placed as shown, in a job of this size, as it assists in heating the water and saves fuel. Check valves must be placed as shown in return lines, otherwise cold water from bottom of boilers might back up to flow line and cool the hot water. When there are fixtures on floor above boiler, the return line should be run up to the branch of one of the higher faucets, and thence back to the boiler, as shown by dotted line No. 6, and omit No. 5.

INFORMATION ABOUT BOILER RATINGS AND THE PAINTING OF RADIATORS

Editor, "Domestic Engineering":—Having noticed that you will be glad to answer questions in connection with the recent Short Course of the University of Illinois, I would like to ask you the following questions about boiler ratings and the painting of radiators:

1.—What method do manufacturers of heating boilers and furnaces use to place a suitable rating on their product?

Is this established by test experiments?

Or is it established by calculation of heating surfaces?

If the latter, I would appreciate to know what assumed temperature is used for the combustion chamber, and what heat transmission factors are used for cast iron and steel surfaces.

2.—In painting the radiators with black, bronze, or aluminum paint, I take it that this paint does not facilitate radiation of radiant rays. That is, the heat does not pass through the painted surfaces as fast as when white paint is used. The heat is not lost altogether, but is stored up awaiting its ability to express itself through the paint in slower measure. Isn't that it?

By this, it would seem that it would take longer to heat a room, but still not take any more fuel worth mentioning, only what is lost through the steam or water pipes.

Mo. K. W. O.

Professor A. P. Kratz, of the University of Illinois, answers the first question as follows:

"1.—The ratings given in manufacturers' catalogues are generally based on the results of actual tests. Most of the formulas proposed for the ratings of boilers and furnaces ignore the heating surface factor and base the results on grate surface alone. In this respect, they can only be approximate and, further, will apply only when the ratio of heating surface to grate surface and the arrangement of heating surfaces conform to some average fixed somewhat by standard practice.

"It is possible to calculate the ratings from considerations based on heat transfer, but the results can be regarded as approximate only since certain assumptions must be made to obtain some of the factors in particular cases.

"The heat transmission is a combination of the two surface effects and the actual conductivity of the metal. The surface resistances form by far the largest part of this combination, and since the difference in the actual conductivity of cast iron and steel is very small, there is no difference in the total heat transmission for the two materials, for the thicknesses used in heating and power boiler practice, under the same conditions."

The second question is answered by Professor W. H. Severns, of the University of Illinois, as follows:

"2.—The color and texture condition, of the radiating surface of a hot body, exert a marked effect on the amount of heat emitted from the surface, per unit of time. Radiator finishes of various colors and chemical composition allow different amounts of heat to be transmitted because of the color and the final surface condition that they produce. The finishes affect the amount of heat given off by conduction and convection very little as compared with the amount of radiant heat emitted. The color is less important than the paint pigment and vehicle with which it is mixed, in the effect on the heat transmission.

"Any finish that reduces the unit heat transmission, reduces the radiator efficiency. This necessitates more surface, at an additional cost, to supply a given heat loss, other conditions being the same. A plain iron radiator of sufficient capacity to supply the heat loss per hour from a room, will not be large enough if the heat transmitting capacity is reduced by a coat of aluminum or gold bronze. The room temperature under these conditions will be lower. The amount of heat given out by the radiator must equal the heat loss from the room in the same period of time if the room temperature is to be constant. There is no storage of heat in the radiator paint or finish. The radiator, with reduced efficiency, will not increase the lowered room temperature in any period of time.

"The percentage of the transmitted heat lost in the piping is increased when the radiator finish cuts down the amount of heat transmitted, other conditions being the same."

A FOUR BILLION DOLLAR BUILDING WITHOUT PLUMBING

A lecturer at Cambridge University in England declares the cost of building King Solomon's Temple was $4,000,000,000 in modern values. If so, it was the costliest structure ever erected for human shelter or the use of the living. The Great Pyramid is the most extraordinary work of masonry ever built, but it was constructed as a tomb for dead royalty. Nobody, so far as we know, ever estimated its cost if erected under modern conditions with a few strikes from year to year.

One fact about the construction of Solomon's Temple is eloquently told in Holy Writ—and that is that efficiency in the building trades as they then existed, was at a high point. But there was no electric wiring to do, no plumbing (in the modern sense), and no steamfitting. It was solid masonry, elaborate woodwork, and exquisite interior decoration, for the most part.

Jacksonville, Fla., will begin work soon on its third comfort station which is to be located in Springfield Park.

The Kiwanis Club of Brandon, Manitoba, Canada, recently gave a concert, the proceeds of which go toward the construction of a public swimming pool in the Provincial Exhibition grounds. This will be the second public swimming pool in the city.

Making Record Sales

MODEL-77

With 7-Jewel Clock 8-Day Thermostat

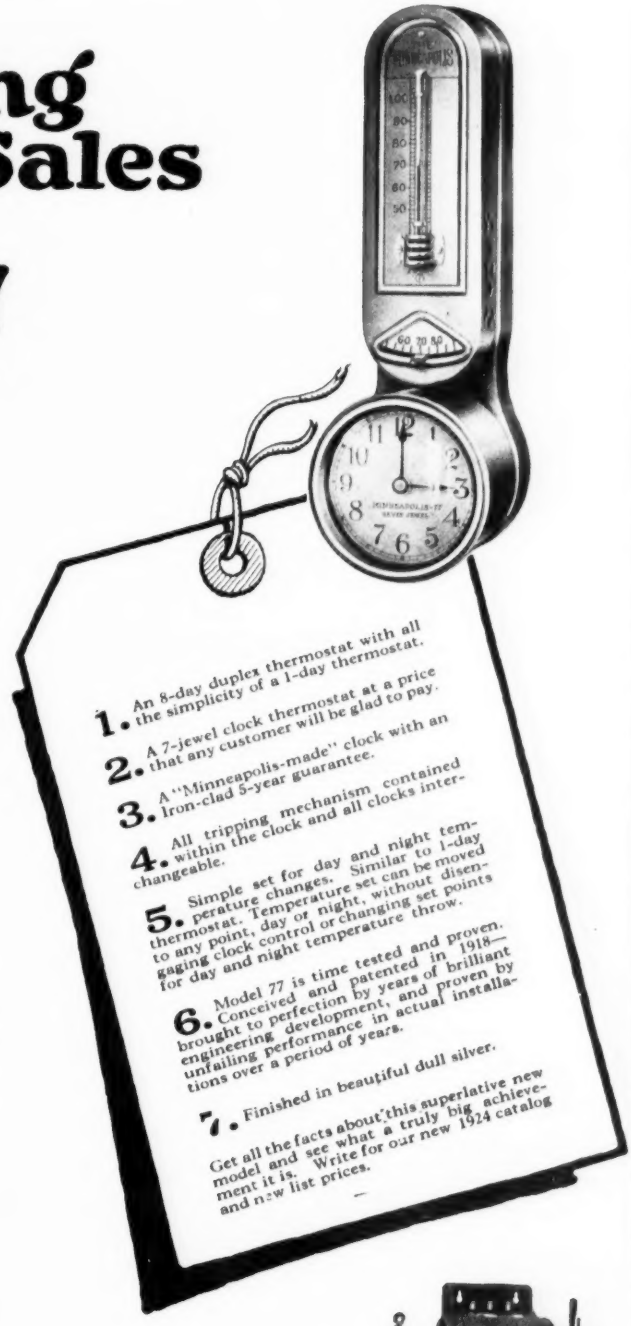
Dealers, everywhere, have recognized in the New Model 77 a big opportunity to increase sales.

They're getting behind it with enthusiasm, pointing out to home owners the remarkable new features of Model 77, striving more earnestly than ever *to sell the job complete.*

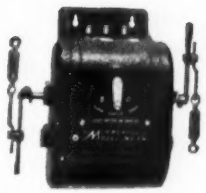
They find that Model 77 is easier to sell and install. They know its great simplicity makes it easier to service; that its increased efficiency makes it still more satisfactory to their customers; and that its low price is a real sales clincher.

Write today for new catalog, list prices, full information about this remarkable new model.

Minneapolis Heat Regulator Co.
Established 1885
2801 Fourth Ave. So. Minneapolis, Minn.


1. An 8-day duplex thermostat with all the simplicity of a 1-day thermostat.
2. A 7-jewel clock thermostat at a price that any customer will be glad to pay.
3. A "Minneapolis-made" clock with an Iron-clad 5-year guarantee.
4. All tripping mechanism contained within the clock and all clocks interchangeable.
5. Simple set for day and night temperature changes. Similar to 1-day thermostat. Temperature set can be moved to any point, day or night, without disengaging clock control or changing set points for day and night temperature throw.
6. Model 77 is time tested and proven. Conceived and patented in 1918—brought to perfection by years of brilliant engineering development, and proven by unfailing performance in actual installations over a period of years.
7. Finished in beautiful dull silver.
Get all the facts about this superlative new model and see what a truly big achievement it is. Write for our new 1924 catalog and new list prices.

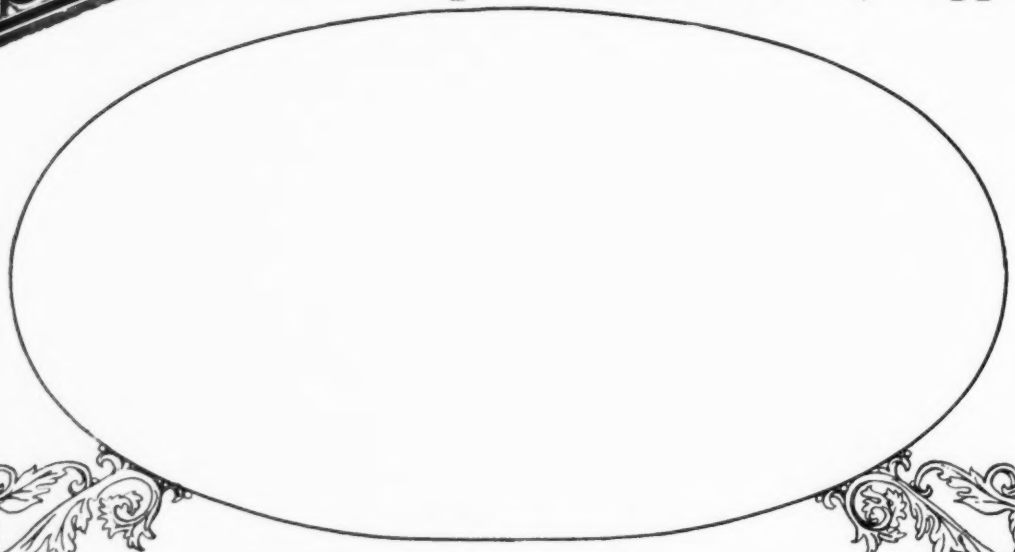
The New A. C. Motor



Improved in many ways—another big "Minneapolis" achievement. All parts made in our own factory. Transformer equipped, cost of operation reduced to less than ten cents per year. All-over die-cast aluminum housing. Safe—Underwriter-approved. Ask for descriptive folder.

The "MINNEAPOLIS" HEAT REGULATOR
"The Heart of the Heating Plant"

RICHMOND PLUMBING SPECIALTIES
from
A "Dependable Source of Supply"



"A Photograph of Our Plant"

would not interest you like the mental picture obtained from such unsolicited expressions as quoted below—

When we advertise "A ***dependable*** source of supply" we mean

Dependable Stock

•••• "In this connection will quote a remark the writer heard our Receiving Clerk make a while back, "I would like to send them an order one time that they could not ship out complete at once." This just to let you know how we feel toward you in this respect. Such service as this is what we harp on the most throughout our own organization, and try to give." •••••

Dependable Shipments

•••• "As previously explained, we like your goods and policies, and have standardized on your line, which we have found to be entirely satisfactory." ••••

Dependable Goods

•••• "The fact is that already your company has built up a very enviable reputation for wonderful service and promptness generally in all their dealings." ••••

The Richmond Foundry & Mfg. Co., Inc.
Richmond, Virginia

JOBBERS: MAY WE SEND YOU OUR CURRENT PRICES ON SPECIALTIES?

Women's Auxiliaries

Mahoning Valley Auxiliary Entertains

The Ladies' Auxiliary of the Mahoning Valley Master Plumbers' Association held a dinner party Thursday evening, November 20, at the association headquarters in Youngstown. An evening of entertainment was then enjoyed, cards forming the chief diversion.

Atlanta Women's Auxiliary

The Women's Auxiliary of the Master Plumbers' Association of Atlanta, Ga., held its regular monthly meeting at the home of Mrs. W. S. Loftis, on Wednesday afternoon, November 12.

A detailed report was given of the efforts of the Committee to place "The Story of the Bath" in the public schools of the city of Atlanta and Fulton County, Georgia. They reported that five thousand copies would be presented to the city and county schools, and that they had the assurance of the superintendents that these books would be used in the sixth grade as supplementary reading, by December 1.

The Committee on Charity reported that they had supplied clothing to a very destitute family. The Auxiliary commended them and ordered the bill for the clothing paid.

After the business meeting, the hostess served refreshments and the afternoon was most enjoyably spent.

Mrs. Wm. Campbell invited the Auxiliary to hold the next meeting at her home in Hopeville, Ga., December 10.

LITTLE ROCK, ARK., TO HAVE PLUMBING LAW

As the Arkansas Supreme Court recently held invalid the city plumbing ordinance, a new ordinance that will meet with the approval of the court is being drawn up, according to Mayor Brickhouse.

PLUMBING LAW TO BE REVISED IN TAMPA, FLA.

A new city ordinance governing the issuance of permits and licenses to plumbers is proposed for Tampa by City Manager Lesley Brown. Mr. Brown contends that the present method of examining plumbing applicants by a written technical examination only is an unfair test.

DENVER, COLO., CHANGING PLUMBING ORDINANCE

The proposed new ordinance for Denver, Colo., provides that the city plumbing commission shall be composed of one master plumber, one journeyman plumber, who also shall be plumbing inspector; one architect, one civil engineer, and one building contractor instead of three master and two journeyman plumbers, as at present.

MAHONING VALLEY MASTER PLUMBERS' ASSOCIATION PURCHASES HOME AT YOUNGSTOWN

Realizing an ambition of many years, the Mahoning Valley Master Plumbers' Association this week completed the purchase of a home of its own at Youngstown, Ohio. A comfortable, commodious residence has been acquired on Lincoln avenue, which will be improved and fitted for club and assembly purposes. It will be the center of activity for plumbing, heating and sanitary interests of the Valley.

The association, which has forty-eight members, will take possession of its new property January 1, 1925. Upon the completion of the remodeling, a membership campaign will be launched.

Frank Smith, the president, Charles Wilson and William Rowland comprised the committee which secured the property. Its acquisition marks the most advanced step ever taken by the association, according to Mr. Smith, who points out that such a center will do much to promote the interests of the organization and its members.

ST. LOUIS PLUMBING INSPECTORS TO RIDE

It is proposed by the Bureau of Municipal Research of St. Louis, Mo., that the plumbing inspectors of the city be equipped with small cars for their trips, which, it is estimated, will save the city $5,000 annually.

FT. WAYNE, IND., TO HAVE NEW PLUMBING CODE

A new plumbing code is proposed for the city of Fort Wayne, Ind. This code provides for the appointment of a board of examiners and outlines the rules and regulations governing drainage, ventilation, water supply and gas piping in buildings to be erected in the city. A city plumbing inspector is to be appointed, together with two practical plumbers—one a contractor and one a journeyman—the three to act as the board of examiners and to register all plumbing contractors. A fee of $5 is provided for examinations, and the license fee is fixed at $25. The code also requires that all plumbing contractors who pass the examination post a $5,000 surety bond with the city.

FREDERICK N. NELSON ADDRESSES CALIFORNIA SANITATION DEVELOPMENT LEAGUE

When Col. W. G. Archer, who was scheduled to address the California Sanitation Development League at San Francisco, Calif., recently was called home by the death of his wife, a substitute speaker had to be procured. Frederick N. Nelson, advertising manager of O'Connor & Moffatt, of San Francisco, was the man selected, and his splendid talk was heard with keen interest and appreciation. Mr. Nelson stressed these four points: Organization, advertising, merchandising and display. He brought out forcibly the evils of price cutting and price "wars"; he showed how judicious advertising creates good will, how merchandising consists of getting a profit as well as a "turnover," and how a good window display is the best recommendation for any merchant. The speaker was introduced by Frank J. Klimm, chairman of the day.

Continuing the constructive work the League is doing in the community by helping the Boys' Aid Society, a Hallowe'en party was given the "future citizens," some of whom, also, may be a credit some day to the plumbing profession. J. Harry Russell and J. R. Whalen acted on the committee for the party. The League will help the boys in a "Boy Scout Drive" which has been instituted, and a troop scoutmaster was appointed from the League.

LECTURE DATES OF THE NATIONAL TRADE EXTENSION BUREAU

The following dates have been announced for Col. W. G. Archer, who has resumed his itinerary: November 24, 26, 27, Los Angeles, Calif.; November 28, Santa Monica, Calif.; November 29, Bakersfield, Calif.; December 2, Pasadena, Calif.; December 5, 6, San Diego, Calif.; December 8, Phoenix, Ariz.; December 10, El Paso, Tex.; December 12, San Antonio, Tex.; December 15, Beaumont, Tex.

The $90,000 plumbing contract for the Embassador Hotel in Kansas City, Mo., has been awarded to the Dawson Heating & Ventilating Company, of Kansas City.

"It Pays to Swim with the Current"

This is about two spark plugs. At the moment they are lying on the sales manager's desk in the establishment of a large middle-western hardware jobber.

One spark plug bears a name known wherever automobiles are used, the other a name seldom heard.

Both, says the sales manager, are good plugs. On the score of quality they run neck and neck.

"But" he adds, "we are discontinuing this line"—and he holds up the plug of unfamiliar name. "Yes, and our discount on it is larger, too."

"What's wrong with it? Not a thing. It's a good plug—mighty good plug, but—no one knows about it. It isn't advertised—the other one is. The demand is for the advertised make. And we've learned it pays to swim with the current, not against it."

More and more jobbers in every line of business are learning every day that it pays to swim with the current of popular demand.

"Our job," said one jobber, "is to supply markets, not create them. Let the manufacturer make a market for his goods, and we will handle it."

Said another—"Our salesmen carry a catalog with thousands of items in it. They haven't the time to push unadvertised goods. Their work is principally taking orders."

If you go among these wholesalers today to introduce a new product in competition with merchandise nationally advertised, unless the article is exceptional, you will be met everywhere by the injunction: "First go out and get a reputation for your goods through advertising."

The wholesaler knows by actual contact with dealers how they value speed of turnover, goods which move with a minimum of effort, goods people know about and ask for.

[Published by DOMESTIC ENGINEERING in co-operation with The American Association of Advertising Agencies]

This & That, Here & There

Ambrose H. Higham, Salt Lake City contractor and president of the Utah State Association of Sanitary and Heating Engineers, recently returned from a trip to Idaho.

The Boston Elevated Railroad Company, of Boston, Mass., has taken out a permit for the construction of a heating plant at 3592 Washington street. The plant will cost in the neighborhood of $25,000.

The Highland Park Plumbing Company, of Louisville, Ky., has been awarded the $13,000 plumbing contract on the new Labor Temple in Louisville.

Thos. J. Shields & Co., 314 East Michigan avenue, Lansing, Mich., are enlarging the quarters occupied by their plumbing and heating business. They will open a salesroom on the main floor, and will occupy the entire three floors of the Shields block.

Robert Jackson, of Carrollton, Mo., has finished the plumbing work in the new Memorial building at Bogard, Mo.

The Miller-Hays Company, of Stockton, Calif., has been awarded the steam heating contract on the new joint union high school in Galt, Calif.

The plumbing and heating equipment for the new Presbyterian Hospital and College of Physicians and Surgeons of Columbia University, which is to be erected at 165th street and Broadway, New York City, is being designed by Werner Nygren, consulting engineer. Contracts have not as yet been let for the operation. The building will cost about $10,000,000

Thomas Haverty, of the Thomas Haverty Company, master plumbers of Los Angeles, has been appointed a member of the convention finance committee of the Los Angeles Builders' Exchange. The duty of this committee is to raise the required funds for the annual convention of the National Association of Builders' Exchanges, which will be held in Los Angeles from February 23 to 26, 1925, with 3,000 delegates in attendance. Mr. Haverty will aid in soliciting the plumbing trade for contributions to insure the success of the convention.

The master plumbers and journeymen of Cincinnati, O., and vicinity were entertained on Thursday evening, November 20, at the Hotel Gibson, by the Cincinnati branch of the Ruud Mfg. Co., of Pittsburgh, Pa. After an elaborate dinner, there was an interesting discussion of automatic and multi-coil heaters.

P. G. James Plumbing Co., of Salt Lake City, Utah, has recently secured the $5,000 heating contract on the Salt Lake Theatre in that city.

The Brandon Heating & Plumbing Company, Limited, of Brandon, Manitoba, Canada, has lately remodeled its store. Several attractive show windows have been arranged, and these have resulted in increased business for the company.

Yates, Neale & Co., 406 Tenth street, Brandon, Manitoba, have been awarded the plumbing and heating contracts on the new Canadian National Railway roundhouse in that city.

The Sabato Heating Company, of Cleveland, Ohio, has been awarded the contract for the installation of the ventilating system in the county jail in that city. The contract amounts to $8,235.

McDaniel & Son, of Litchfield, Ill., have secured the contract for plumbing and heating on the apartment which will be erected over Sterneck's Store on North State street, in that city.

A. W. Hoppert, of the Wahpeton Plumbing & Heating Co., Wahpeton, N. Dak., vice-president of the North Dakota Master Plumbers' Association, was in Chicago last week. During his stay he visited the plumbing classes of the Building Trade School of the Citizens' Committee and the plumbing classes at Lane Technical High School. Mr. Hoppert is teacher of the plumbing classes at the State School of Science, Wahpeton, N. Dak.

The Wahpeton Plumbing & Heating Co. is now installing the plumbing equipment in the new United States Indian School at Wahpeton.

Ray Sharp, of Bedford, Iowa, has been making improvements in the Vogt building and will move his plumbing establishment to that location in the near future.

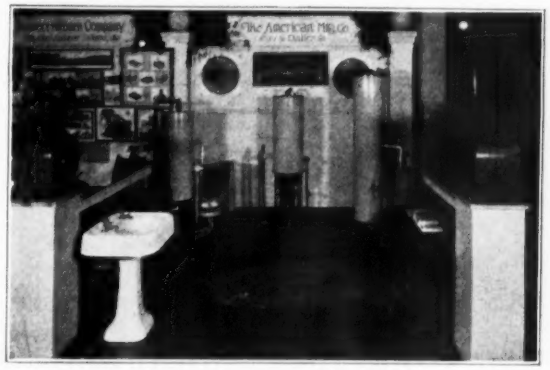
The contract for the plumbing and heating on a new community house in New Orleans, La., has been awarded to the American Plumbing & Heating Co., on its bid of $2,845.

The Hude Plumbing Co., of Gregory, S. Dak., has suffered a fire loss of $11,500. The loss was covered by insurance.

A contract for the installation of plumbing and heating in the New Canadian Pacific Railway hotel at Banff, Alberta, which is to replace the building recently destroyed by fire, has been awarded to the Vancouver firm of Barr & Anderson. The contract amounts to $150,000. The contract means the heating of three hundred rooms and will include four hundred radiators. There will be two hundred eighty-two baths and more than nine hundred other plumbing fixtures installed.

An ordinance regulating the installation of home heating systems so that the health and safety of householders may be more closely protected will probably be introduced in the Cincinnati, Ohio, city council soon. This movement, according to John K. Peck, president of the Peck-Hannaford & Peck Co., heating contractors, is due to the fact that while home owners are protected from the danger of faulty plumbing, gas fitting and electric wiring, Cincinnati laws furnish no security against poor heating installations.

During the fiscal year, covering part of 1923 and part of 1924, licenses were granted to 47 master plumbers by the bureau of plumbing examiners of Montreal, Quebec. Journeyman plumbers' licenses granted numbered 35. Existing master plumbers' licenses to the number of 506 were renewed, and journeyman plumbers' licenses to the number of 381. This is no indication of the actual proportion of masters to journeymen, as many holders of masters' licenses are working as journeymen.



The exhibit of the American Manufacturing Co., of Dayton, Ohio, at the Greater Dayton Building Exposition, held recently in that city

New Business Ventures

William Bulmer, of Brandon, Manitoba, Canada, has opened a new plumbing and heating establishment at 338 Percy street in that city.

The J. W. Ashton Plumbing & Heating Company, of Lakewood (Cleveland), Ohio, has been incorporated, with a capital of $10,000, by George A. Phillips and O. D. Eshelman. This company will conduct the business formerly carried on by J. W. Ashton, of Lakewood.

The Kern Sanitary Engineering Co., of Morgantown, W. Va., has been incorporated, with a capital of $100,000, by Ben Green, 320 High street, and others.

F. R. Arnold has opened a plumbing and heating shop in Albert Lea, Minn.

The Daniels Heating & Plumbing Co., of Glendive, Mont., has opened a branch in Dickenson, So. Dak., with C. D. Maullin in charge.

Delta Electric & Plumbing Co., of Greenville, Miss., has been incorporated, with a capital of $10,000, by G. B. Edwards, Walter McCrary and others.

The Haffer-Mandell Heating Co. has been organized and has opened a store at 410 Blue Hill avenue, Boston. John Mandell is in charge.

E. O. and U. Stice have engaged in the plumbing and heating business at 1632 East Colorado street, Eagle Rock, Calif., under the name of Earl O. Stice Co.

Business Changes

G. E. Beard, of Lake Side Plumbing Company, Charlevoix, Mich., has closed his business in that town, and has moved to Petoskey, Mich., where he will open a plumbing establishment at an early date.

R. A. Potts, of Nashville, Tenn., has taken over the business of Potts & Snyder, plumbing and heating contractors of that city. The business will be continued at 4806 Charlotte avenue.

Cy Jones, of Taylorville, Ill., has moved his plumbing establishment to the new Horn-Jones building on South Main street.

Naylor Plumbing & Hardware Company, of Oakland, Calif., has moved across the street from its former location to a new building at 3214 Adeline street, in that city.

Bennett & Bradfield have succeeded to the business of Newman & Bennett Plumbing & Heating Co., at Trenton, Mo.

Riley & Adams, Inc., New Haven, Conn., have amended their certificate of incorporation to provide for the distribution of oil burning equipment. The company also announces a change in name. In the future the concern will do business under the name of the Providence Oil Burner Co., Inc.

Vincent M. Peters and Clarence J. Peters, 119 York street, Rochester, N. Y., will hereafter conduct their business under the name of Peters Brothers Plumbing & Heating Company.

PLUMBING CLASS POPULAR IN JACKSONVILLE HIGH SCHOOL

From one to three apprentices from each plumbing shop in the city are enrolled in the plumbing class of the high school in Jacksonville, Fla., which recently opened its second term under the able direction of John A. Walker.

COAST COUNTIES MASTER PLUMBERS' REGULAR MEETING

The Coast Counties Master Plumbers' Association, which comprises the district from Morgan Hill to Santa Maria, Calif., held its monthly meeting at the Pacific Grove City Hall, Pacific Grove, Calif., recently. Edward Simpson, of Pacific Grove, president of the Association, opened the meeting. He introduced W. H. Graham, president of the California State Association, whose topic was "What the Association Means to Its Members." Other speakers who addressed the body were Harry G. Newman, Charles G. Newkirk, Edward Looker, C. A. Edgeworth and W. H. Barry.

OREGON MASTER PLUMBERS ENTHUSED BY COL. ARCHER'S RECENT TOUR THERE

Col. W. G. Archer, of the National Trade Extension Bureau was given a royal welcome in the State of Oregon on his recent trip through that territory. Arriving at Portland from his tour of Washington, he spoke at a public and well-attended meeting under the auspices of the Portland Master Plumbers' Association.

After his Portland appearance, members of that association made up an automobile party and conducted Col. Archer through the State to the California State line. Stops were made at Salem, Medford, Eugene, Astoria and Roseberg before civic and commercial clubs and Col. Archer was everywhere given a rousing reception. At several Rotary Club meetings, Col. Archer was not allowed to sit down at the close of his talk, but was asked to speak extemporaneously on sanitation as he has seen it on several of the other continents of the globe.

At Medford, Oregon, his work showed immediate results in the formation of a local master plumbers' association of six members, which is more than fifty per cent of the total number of master plumbers in the city.

SALT LAKE CITY SANITARY AND HEATING ENGINEERS MEET

"Friendship should be founded upon business, not business upon friendship," declared Heber Aldus, assistant manager of the Salt Lake City Branch of Crane Co., at the regular weekly luncheon of the Salt Lake City Sanitary and Heating Engineers' Association. Mr. Aldus stressed the value of friendship and co-operation in business, stating that a united, intelligent effort was bound to secure results.

Young men who are being taken as apprentices into the plumbing shops should have as high a degree of intelligence as those studying law, medicine, or any other of the professions, as the plumbing and heating industry is just as important, said Mr. Aldus. The public should be educated to an appreciation of the technical knowledge necessary, because of the impression frequently prevailing that anyone who can handle a wrench and a hammer can do plumbing.

A motion by Pomeroy Spencer, chairman of the board of governors, that the association purchase fifty copies of the government book, "Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings," which is the final report of the sub-committee on plumbing of the building-code committee, was passed. The book will be distributed both to members and non-members.

The Association will again contribute $150 to the $75,000 campaign fund now being raised by the Chamber of Commerce to advertise Salt Lake City during the coming year. Ralph D. Evans and Henry Green were appointed as a team to represent the Association during the drive.

Legal Decisions

GUARANTY NOT APPLICABLE TO SUBSTITUTED BOILER

IN reversing a judgment that was rendered for the defendant, a school district, in an action instituted by one Pomerene and after his death revived by the administratrix of his estate, the United States Circuit Court of Appeals, Eighth Circuit, says (288 Federal Reporter, 145) that Pomerene made a contract with the defendant school district to furnish material and do certain plumbing and furnish material and do the necessary work to install a heating plant in a new high school building; and he began this action to recover an alleged balance due him, made up of the amount of his bid and extras which he claimed he was directed to furnish.

There was no serious dispute about the extras nor amounts claimed for them, but by answer and cross-complaint the school district denied liability and it asked judgment against Pomerene for $6,055.48; its contention being that the plant would not heat the building, that the school district was compelled to take out the boiler that Pomerene had installed and replace it with one of larger capacity in order to make it serviceable, which it did at an expense to it in the amount which it sued for in its cross-complaint, and that Pomerene was liable to it therefor under a provision in the architect's specifications which were made part of the contract by reference, reading thus:

"The contractor must guarantee the perfect operation of the plant in every detail. That it will fill and circulate with steam in all its parts at once and at the same time with a pressure of not to exceed one-half pound. And that there will be no waste of either steam or water. That the apparatus will be noiseless in operation and maintain a temperature of 70 degrees when the outside temperature is 20 degrees below zero, provided the building is kept reasonably tight."

At the close of the trial both sides moved for a directed verdict and the trial judge, being of the opinion that Pomerene was bound by the guaranty, on that ground alone overruled the plaintiff's motion and sustained the defendant's, whereupon verdict and judgment went for the defendant on its cross-complaint for $6,000.00. There was no doubt that the boiler installed by Pomerene was too small for the service required. It did not fulfill the guaranty. It did not keep the building sufficiently warm in cold weather for occupancy. But unless Pomerene was bound by the guaranty there was nothing to sustain the verdict and the judgment; and this court thinks that he was not bound and that the district judge committed an error in law in holding that he was.

The guaranty clause was inserted in the specification on the plain assumption and implied condition that bidders had the right to select the boiler which they proposed to put in, and if they did not care to take those expressly named in the specification they would at their own risk select one equal in capacity. It was clearly intended as a security against that risk. But when Pomerene was asked to bid the school district had already made the selection. He was not given the right and opportunity provided in the specification of bidding on the boiler of the type and capacity specified, or of selecting at his own risk some other make which, in his judgment, would be of equal capacity. After the contract was made with Pomerene the board, moved by

It is NOT THERMOSTATIC!

POWERS shower mixers have no thermostatic coils nor diaphragms, yet they have the safety feature found in thermostatic mixers.

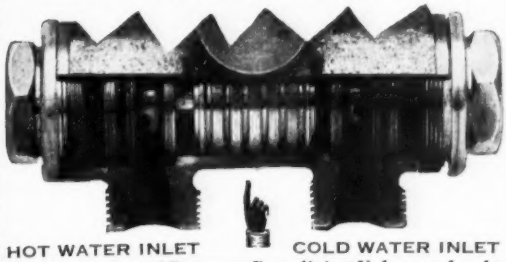
Without one great improvement—**a Pressure Equalizing Valve**—a Powers mixer would be just "another" shower mixer.

This Pressure Equalizing Valve, shown below, is a floating piston which controls and equalizes the pressures of hot and cold water BEFORE they enter the mixing chamber.

No matter how violently water pressures vary, it provides the positive safeguard against scalding and unexpected temperature changes.

Find out why users of other mixers are turning to Powers mixers. Read what they say! Send for our book, "How to Prevent Scalding and Repair Troubles in Shower Baths." It's FREE.

THE POWERS REGULATOR CO.
2716 Greenview Ave., Chicago
New York, Boston, Toronto and 30 Other Offices
See your telephone directory.



Cut-away view of Pressure Equalizing Valve used only in the Powers Shower Mixer

The Simplex Flush Valve is constructed like an injector, its outlet being tapered, and this causes the water to be delivered to the bowl with greater flushing power.

This feature is important in low water pressure districts. There is never any water hammer to the Simplex, either in opening or closing. The water pressure itself closes the valve after each operation, and meters the length of each flush.

The Simplex will operate on any pressure from five to one hundred pounds, where there is a sufficient volume of water, and it does not require regulating regardless of the amount of water pressure.

SIMPLEX

THE BEATON & CADWELL MFG. CO.
New Britain, Conn.

Please send at once Catalogue and other information on the Simplex Flush Valve, together with price list.

Name .....

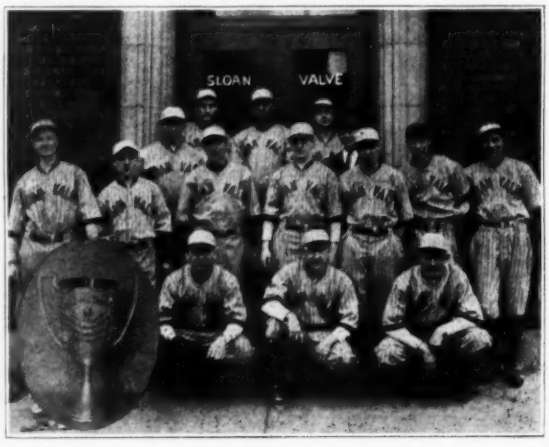
Address .....

a desire to save fuel, substituted another boiler, which Pomerene put in, and the record showed that it did so under the right reserved to it in the general specifications. The board having selected the make and size of boiler on which Pomerene was asked to bid, and then having contracted with him for one or the other of their own selection, this court thinks the purpose of the guaranty clause, in so far as it related to the heating capacity of the boiler, was put aside and did not become a part of Pomerene's contract. Giving to the guaranty clause the meaning and purpose which this court thinks must be attributed to it, the board, after binding Pomerene to put in a boiler which it selected, was not in a position on the facts of the case to complain about its heating capacity. This court puts out of view the contention that on the assumption of applying the guaranty clause to Pomerene's contract, he was required to do the impossible, to wit, make the boiler selected by the board serve a heat capacity in excess of its heat capacity—and for that reason there could be no legal liability; for it is the court's opinion that the clause could not be applied to Pomerene's contract. He never made the guaranty, and was not bound by it in his contract.

SLOAN VALVE COMPANY'S ATHLETIC ACTIVITIES

For the baseball team of the Sloan Valve Company, of Chicago, to come out champion the very first year of its existence is something to be proud of, and the team takes a bow. It is especially admirable to have whipped such worthy opponents as the teams representing Weil-McLain Co., Kelly & Jones Co., Whitney & Ford, and Jas. B. Clow & Sons. Much of the credit for the success of the team is due to the untiring effort of its manager, C. J. Gartner, and the captain, Oscar Stammer.

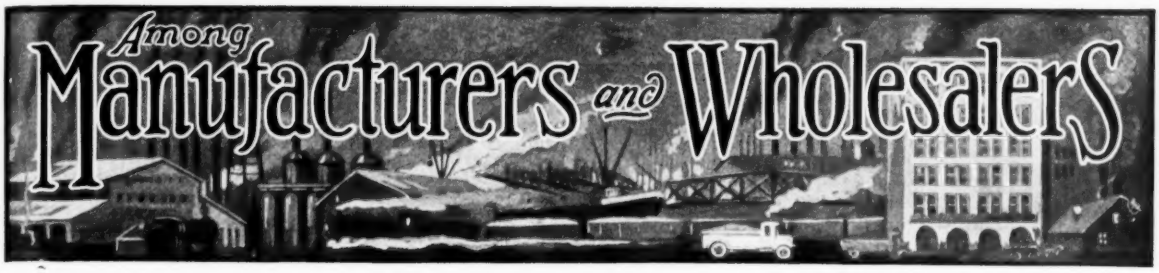
The Sloan Valve Company also has a live crowd of enthusiastic bowlers, the Sloan bowling team having lost



The baseball team of Sloan Valve Co., of Chicago, and the Championship Cup it won

but one game out of eighteen which have been played in the West Side Manufacturers' League. Every Tuesday night the eight teams within the Sloan organization strive among themselves for the honor of being on the team which is to represent the company in the West Side Manufacturers' League, and likewise for the prizes to be distributed in the Sloan League at the season's end.

Axel Neuman, of St. Paul, Minn., has been awarded the plumbing and heating contracts on the agricultural school at Grand Rapids, Minn.



COMPANIES RECENTLY INCORPORATED

The Blue Blaze Burner Company, of 1910-16 Main street, Kansas City, Mo., has been incorporated with a capital of $15,000, to manufacture oil burners. The incorporators are: L. H. Borserine, J. R. Steele and H. C. Waltner.

The Boston Sanitary Service Company, Inc., of Boston, Mass., has been incorporated with a capital of $25,000. The incorporators are: Jos. F. Murphy, Frank M. Doyle and William A. Noonan.

The J and L Oil Burning System Co., 2802 North Kedzie avenue, Chicago, has been incorporated with a capital of $50,000, by Lyle S. Abbott, Benjamin B. Jones and Frank Lochner.

The H. G. Webb Co., Westboro, Mass., was recently incorporated to deal in heating and plumbing supplies, the incorporators and officers being Henry G. Webb, president; Ezra H. Bigelow, Northboro, Mass., treasurer; and John L. Bigelow.

The General Heat & Power Corporation, Hartford, Conn., has been incorporated with a capital of $50,000, to deal in heating supplies. The incorporators are: Frank E. Wilder, Arthur L. Wilder and Ceylon E. Bedell.

MOVES INTO NEW BUILDING

The Dalziel-Moller Co., of San Francisco, Calif., has moved into its new building at 1666 Mission street. The building was especially erected for its use and is modern in every respect.

BAKER MFG. CO. ADDING TO ITS PLANT

The Kansas City branch of the Baker Manufacturing Co., of Omaha, Nebr., has just completed the construction of a new pipe shed, 40x120 ft. It contains an overhead track and a crane for unloading.

TWO NEW WAREHOUSES AT BOSTON COMPLETED

The new warehouse of the Standard Sanitary Manufacturing Company's branch at Boston, Mass., has been completed. This is one of the largest warehouses used for plumbing supplies in the East and is located in the South Boston district, giving it easy shipping facilities by rail and water, beside ample floor space. Robert E. Sargent, New England manager for the company, has had general charge of the construction of the building and has been showing some of his friends over the completed and well-stocked building. The offices of the company will be maintained as formerly at 186 Devonshire street.

Kohler Company, of Kohler, Wis., has completed the construction of its new warehouse at C street and Claflin street, South Boston, Mass., and has taken possession. Offices of the New England branch of the company have been removed from 427-445 Commercial street to the new building, giving much needed additional room. The new building and offices are well equipped and officials of the company are receiving congratulations upon their practical arrangement.

MEETING OF CRANE CO.'S PACIFIC COAST BRANCH MANAGERS

R. T. Crane, Jr., president of Crane Co., Chicago; J. B. Barryman, vice-president; A. F. Gartz, Jr., director, and R. B. Stiles, general manager of branches, attended the semi-annual meeting of Pacific Coast branch managers of Crane Co., which was held at Del Monte, Calif., on November 10, 11 and 12.

WILL SOON OPEN NEW ENGLAND OFFICE

George S. Seltzer, New England sales agent for the Pittsburgh Valve Foundry & Construction Co., of Pittsburgh, Pa., has leased a suite of offices in the Unity building, 185 Devonshire street, Boston, Mass., where New England headquarters of the company will be maintained.

SMITH SANITARY SUPPLY CO. ORGANIZED

The Smith Sanitary Supply Co., with headquarters at 106 West Depot street, Knoxville, Tenn., has been organized to deal in plumbing specialties. Karl N. Smith, one of the members of the new company, was formerly in Fort Wayne, Ind., where he was president of the Credit Men's Association.

AMERICAN PLUMBING FIXTURES IN DEMAND IN JAPAN

A. C. Conrad, who has been in Japan for the M. Stulsaft Co., of San Francisco, Calif., has just returned to the United States, and reports that building has not commenced in earnest since the earthquake, the only new structures being those which were in the course of construction before the quake. Because of quicker delivery, American made plumbing and heating material is used

George A. Lutz, of the Zwermann Co., Robinson, Ill.; Thomas Kendrew, of the Enterprise Brass Co., Muskegon, Mich.; F. W. Terwilliger, of the American Plumbers' Supply Co., Toledo, Ohio, and "Sy" Martin, of H. P. Martin & Sons, Owensboro, Ky.—From "Domestic Engineering" photograph taken at Central Supply Association's recent annual meeting in Chicago

almost exclusively in Japan. The Japanese are quite like many American contractors; they wait until the last minute to place their plumbing and heating order and then ask the agent to cable the order and deliver it in fifteen days.

HUDSON BOILER MFG. CO. MOVES TO HOBOKEN, N. J.

The Hudson Boiler Manufacturing Company, for several years located at 359 West 42d street, New York City, has moved to 11th and Hudson streets, Hoboken, N. J. The space formerly occupied by the Hudson Boiler Manufacturing Company at the 42d street address has been taken over by I. Jacobs, who recently organized the West Hudson Supply Company, and will deal in boilers and heating supplies. This item was inaccurately reported in our November 15 issue, much to our regret.

B. HOFFMANN MFG. CO. EXPANDING

The B. Hoffmann Mfg. Co., 257 Sixth street, Milwaukee, Wis., has bought a site, on which are already some buildings, at 1809 St. Paul avenue, and will build a $65,000 addition which will be used as a machine shop, pipe shop, offices and storage space. This addition will be 55x170 ft.

W. A. BUERKLE SALES CO. TO HOLD HOUSEWARMING

The W. A. Buerkle Sales Company, distributors for the Pittsburg Water Heater Co., Pittsburgh, and Bryant Heater & Mfg. Co., of Cleveland, Ohio, in the Metropolitan district, will hold a house warming at its new home, 351-9 Atlantic avenue, Brooklyn, N. Y., on Saturday, December 6. A big crowd of jobbers and manufacturers' representatives is expected.

BUILDING PERMITS FOR OCTOBER

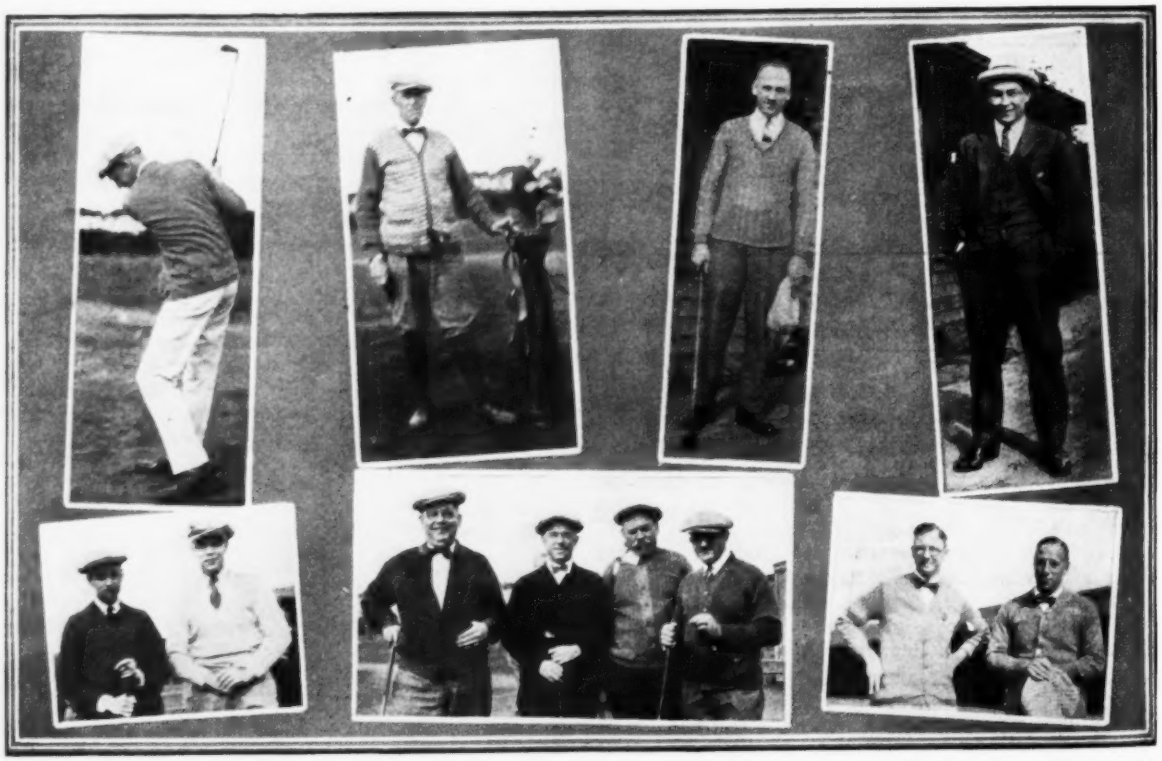
Reports from 210 Cities Indicate That Much Construction Work Will Be Done During the Winter

Two very important facts are reflected in the October building permit returns from 210 cities as reported to the "American Contractor." The first is that Winter construction may be looked for on a greater scale than ever before. Education to the fact that it is better for the construction industry to risk cold fingers than to resign to cold feet evidently has taken even more hold than its promoters realize. Of course the battle is not entirely won, but many now understand that Winter work pays. The second fact is that there was no regression, but rather an advance, in building planning during the month immediately preceding the election. The doubt as to its outcome did not have any effect on planning for work as far as the stage of taking out building permits goes.

The first 10 months of this year have piled up a record in building permits issued that would have seemed amazing 5 years ago, and more than amazing in 1913. The total valuation for the 210 cities for October of this year is $292,370,116. This is a 7 per cent gain over the figures for October of last year, and a substantial gain over September of this year.

The gain for October over September comes more from a widespread pickup than from any individual city's spectacular gains. In fact New York City is the one case for the month of an outstanding gain—this practically 15 million dollars.

Considering statistics from New York, Chicago, Philadelphia, Boston, Pittsburgh, Detroit, Los Angeles, Baltimore, San Francisco, Cleveland, Seattle, Minneapolis,



At the California Sanitation Development League Golf Meet, held recently in San Francisco, Calif.—Top row, left to right: A. Dalziel, Dalziel-Moller Co., San Francisco, Calif.; Andy Lamond, San Francisco, Calif.; Loyd Logsdon, Mueller Company, San Francisco branch; Monte Henderson, assistant manager, Mueller Company, San Francisco branch—he made a hole in "one."—Bottom row, left to right: Emile Heyman, manufacturers' agent; Jack Heil, Reading Iron Co., San Francisco branch; Frank J. Klimm, W. J. Monihan, G. Y. Morton, W. P. Goss, of San Francisco, Ben Blair and Newton Stern, of the Pacific Sanitary Mfg. Co., San Francisco, Calif.

R. C. MACY ADDITION		SAKS NEW STORE
Robert D. Kohn	*Architects*	Starrett & Van Vleck
W. G. Cornell Co.	*Plumbing Contractors*	W. G. Cornell Co.
John Simmons Co.	*Plumbing Fixtures*	Crane Co.

NEW YORK DEPARTMENT STORES

Equipped throughout with

Royal Flush Valves

So much depends on the mental attitude of the shopper that the modern department store cannot afford to overlook anything that gives greater convenience or comfort.

To find so many of the most prosperous stores equipped throughout with Royal Flush Valves is but an indication of the satisfactory service given by this modern flushing equipment.

Such service is of course the result of their exclusive features. Changes in pressure do not change the quantity of their flush nor is it affected by frequent or abusive operation.

MANUFACTURED BY

SLOAN VALVE COMPANY
CHICAGO

BRANCH OFFICES

Albany, N. Y.	Buffalo, N. Y.	Des Moines, Iowa	Los Angeles, Cal.	Nashville, Tenn.	San Francisco, Cal.
Atlanta, Ga.	Cincinnati, Ohio	Detroit, Mich.	Memphis, Tenn.	New Orleans, La.	Seattle, Wash.
Baltimore, Md.	Cleveland, Ohio	Durham, Conn.	Miami, Fla.	New York City, N. Y.	St. Louis, Mo.
Bayonne, N. J.	Dallas, Texas	Indianapolis, Ind.	Milwaukee, Wis.	Philadelphia, Pa.	Washington, D. C.
Boston, Mass.	Denver, Colo.	Kansas City, Mo.	Minneapolis, Minn.	Pittsburgh, Pa.	

CANADA

Winnipeg Toronto Montreal

Rundle sinks have a reputation for being extremely practical. The reason is this:

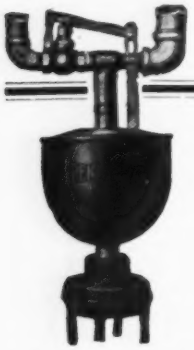
Rundle engineers have made a special study of kitchen problems and designed sanitary enameled sinks to make kitchen work easier for the housewife.

They are simple in design and built for convenience. Highest grade of enamel, quality through and through.

Write for name of jobber near you who handles the Rundle line.

Rundle Manufacturing Company
Milwaukee, Wisconsin

RUNDLE
PLUMBERS' SANITARY ENAMELED WARE AND FITTINGS



Automatic Cellar Drainer

Every Home a Live Prospect

The average home owner may not know what the **Penberthy Automatic Cellar Drainer** is or does, but most of them have experienced the discomfort, inconvenience and expense of flooded basements and would be quite willing to exchange a few dollars for such a device that insures against the repetition of such an occurrence.

You make more money selling and installing a Penberthy Cellar Drainer than on a back water trap—and you give your customer something he can depend upon, absolutely.

Your jobber sells them.

PENBERTHY PRODUCTS
REG. U.S. PAT. OFF.

Penberthy Injector Co.
Established 1865
1244 Holden Ave. Detroit, Mich.
Canadian Plant Windsor, Ont.

Kansas City, St. Louis, Dallas, New Orleans, Indianapolis, Milwaukee, Buffalo and Atlanta, we find that every one on the list except Los Angeles, Indianapolis, Boston and Milwaukee show for October gains over September.

	October, 1924		October, 1923	
	No. of Permits	Valuation	No. of Permits	Valuation
Alabama—				
Birmingham	742	$2,487,594	554	$1,544,183
Arkansas—				
Fort Smith	193	116,401	179	128,308
Little Rock	251	510,230	285	326,698
California—				
Alameda	102	192,093	85	129,879
Compton	79	95,392	93	172,075
Fresno	151	181,355	228	1,392,081
Glendale	262	811,845	327	805,506
Long Beach	483	986,275	489	2,336,695
Los Angeles	4,312	11,057,277	6,632	20,541,872
Oakland	1,210	2,619,703	1,275	2,759,208
Pasadena	333	1,551,667	436	1,062,362
Sacramento	321	914,829	364	448,897
San Diego	625	1,125,341	535	1,318,147
San Francisco	818	6,116,313	909	3,793,374
San Jose	112	183,950	119	207,040
Santa Ana	84	169,690	154	401,578
Stockton	129	12,909,200	164	323,700
Colorado—				
Colorado Springs	113	91,982	119	770,075
Denver	916	2,769,200	630	2,386,600
Pueblo	133	303,894	97	63,255
Connecticut—				
Bridgeport	171	437,847	130	175,770
New Haven	173	486,798	182	1,586,085
Delaware—				
Wilmington	100	189,432	100	176,949
District of Columbia—				
Washington	857	4,048,236	797	2,273,096
Florida—				
Jacksonville	363	488,727	337	2,442,819
Lakeland	88	187,525	88	116,165
Miami	381	1,009,351	304	560,026
Pensacola	62	35,166	68	53,256
Tampa	469	581,914	254	202,212
Georgia—				
Atlanta	452	1,335,105	424	1,133,323
Augusta	152	66,311	192	40,888
Macon	188	132,938	194	139,405
Savannah	57	58,509	52	89,575
Idaho—				
Boise	91	84,997	80	32,448
Illinois—				
Aurora	114	204,860	163	302,866
Chicago	1,371	23,830,350	1,618	27,837,350
Decatur	158	428,125	140	315,950
East St. Louis	131	410,529	158	306,550
Evanston	156	1,277,670	160	1,300,239
Maywood	59	190,925	79	426,000
Peoria	265	288,295	183	447,725
Quincy	23	59,371	24	40,710
Rockford	210	283,340	174	253,355
Springfield	252	274,650	187	774,408
Indiana—				
Elkhart	15	56,200	24	70,850
Evansville	329	428,360	228	284,360
Fort Wayne	288	798,768	274	745,600
Gary	210	707,946	161	372,825
Hammond	145	514,825	122	338,200
Indianapolis	1,831	2,078,707	1,751	2,757,826
Richmond	64	104,067	68	45,871
South Bend	410	382,620	506	613,042
Terre Haute	342	300,839	232	319,630
Iowa—				
Cedar Rapids	120	247,790	154	312,090
Davenport	91	120,737	156	653,083
Dubuque	106	134,616	57	176,365
Mason City	34	36,7:0	77	72,105
Sioux City	164	580,585	133	305,775
Kansas—				
Kansas City	97	304,155	165	218,135
Topeka	186	202,362	177	734,076
Wichita	289	474,511	327	447,077
Kentucky—				
Covington	83	151,400	58	101,050
Lexington	81	211,385	79	176,160
Louisville	524	2,145,115	449	848,262

A Tank of Standard Design and Quality

ZWERMANN CO. ROBINSON ILL. TRADE MARK

Plate No. 8—Tank. A genuine two fire vitreous china tank, 22 inches long, 17 inches high and 8 inches wide.

THERE'S no need of your spending a lot of time deciding which tank to use on this job and which on that. Get the habit of using the Zwermann Tank on all of your jobs—its size, design and quality have been standardized by years of experience. It is just right in every respect for the great majority of toilet installations.

Sold only thru the jobber

ZWERMANN CO.

Producers of genuine two fire vitreous china water closet tanks and closet bowls.

ROBINSON, ILL.

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros

At the nearest supply house

Fig. 106, screwed, Jenkins Bronze Globe Valve.

Stocks of Jenkins Valves are carried by supply houses, EVERYWHERE, and are convenient to buy. There is always a source of supply near you.

Additional valves may be secured without needless expense, worry, or loss of time. Then, too, because all parts of Jenkins Valves are made to limit gauges on an interchangeable basis, replacements can be obtained from your local supply house with the full assurance that the new part will fit.

Valves in bronze, iron, and steel for practically every requirement.

JENKINS BROS.

80 White St.....New York, N. Y.
524 Atlantic Ave.....Boston, Mass.
133 N. Seventh St.....Philadelphia, Pa.
646 Washington Blvd.....Chicago, Ill.

JENKINS BROS., LIMITED
Montreal, Canada London, England.

Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

A SINGLE PIPE VAPOR SYSTEM

At Low Cost!

Any Steam Heating System can be changed to a ***Vapor System***, easily, quickly, and at a small expense.

Our Vapor Booklet tells the story—

Send for a copy.

GORTON & LIDGERWOOD CO.

96 Liberty Street, New York

C. W. BEDELL
273 Congress Street
Boston, Mass.

H. M. GASSMAN
513 N. 21st Street
Birmingham, Ala.

DUANE L. BLISS, Jr.
Rialto Building
San Francisco, Cal.

CHAS. A. MANN
155 N. Clark Street
Chicago, Ill.

J. E. PERKINS CO.
113 E. Franklin St.,
Baltimore, Md.

JOHN H. DODD
1505 N. Haskell Avenue
Dallas, Texas

WM. G. MOORMAN
325 Ellicott Square
Buffalo, N. Y.

ALABAMA PIPE CO.

ANNISTON, ALABAMA

GENERAL OFFICES

• • •

A consolidation of these foundries—

WATER MAINS

STANDARD FOUNDRY CO. ..... *Anniston, Ala.*

SANITARY PIPE

STANDARD FOUNDRY CO. ..... *Anniston, Ala.*
UNION FOUNDRY CO. ..... *Anniston, Ala.*
ALABAMA PIPE & FOUNDRY CO. ..... *Anniston, Ala.*
ORNAMENTAL FOUNDRY CO. ..... *Anniston, Ala.*
COOSA PIPE & FOUNDRY CO. ..... *Gadsden, Ala.*
AGRICOLA PIPE COMPANY ..... *Gadsden, Ala.*
GADSDEN PIPE COMPANY ..... *Gadsden, Ala.*
IMPERIAL PIPE COMPANY ..... *Bessemer, Ala.*
SUPERIOR PIPE COMPANY ..... *Bessemer, Ala*
TALLADEGA PIPE CO. PLANT NO. 1. *Talladega, Ala.*
TALLADEGA PIPE CO. PLANT NO. 2. *Talladega, Ala.*
RABE PIPE & FOUNDRY CO. ..... *Chattanooga, Tenn.*

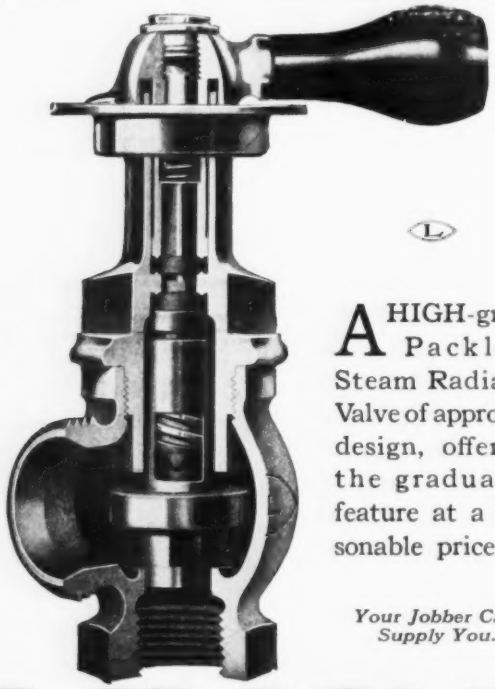
Sales Offices:

WM. M. BYRD, JR.
General Sales Manager
1055 PEOPLES GAS BLDG.
CHICAGO

JOHN F. McCLURE
342 MADISON AVENUE
NEW YORK CITY

CHAS. STANYAN
1749 SACRAMENTO SQUARE
SAN FRANCISCO

CHICAGO WAREHOUSE
1427 WEST 37TH PLACE
CHICAGO



A HIGH-grade Packless Steam Radiator Valve of approved design, offering the graduated feature at a reasonable price.

Your Jobber Can Supply You.

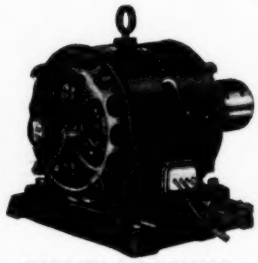
LAVIGNE

COMMONWEALTH BRASS CORPORATION - DETROIT

	October, 1924		October, 1923	
	No. of Permits	Valuation	No. of Permits	Valuation
Louisiana—				
New Orleans	286	1,425,800	281	1,558,315
Shreveport	340	595,642	301	400,238
Maine—				
Portland	136	295,045	118	337,150
Maryland—				
Baltimore	2,657	3,547,920	2,127	3,854,988
Cumberland	38	61,050	47	105,920
Massachusetts—				
Beverly	52	49,480	58	54,720
Boston	1,246	3,712,274	986	3,556,341
Brockton	120	128,070	119	176,955
Cambridge	123	870,406	112	432,625
Chelsea	35	109,410	39	65,850
Chicopee	98	334,025	82	246,225
Fall River	125	1,019,975	165	280,575
Fitchburg	42	65,805	47	95,147
Haverhill	41	53,010	52	142,485
Holyoke	78	333,500	106	232,875
Lawrence	47	325,625	139	1,018,355
Lowell	123	336,030	163	438,287
Lynn	172	414,571	125	303,660
Medford	116	714,405	105	345,878
New Bedford	103	471,300	139	887,900
North Adams	11	17,860	30	23,120
Quincy	254	507,404	196	621,005
Salem	115	100,610	106	135,985
Somerville	84	203,020	107	264,025
Springfield	355	1,320,100	231	723,815
Waltham	49	87,730	52	112,165
Worcester	355	1,181,195	343	1,269,855
Michigan—				
Battle Creek	125	328,329	119	228,925
Bay City	173	98,278	148	72,744
Detroit	4,003	14,952,086	3,426	12,485,880
Flint	421	500,836	804	1,003,151
Grand Rapids	712	614,310	567	686,660
Jackson	140	137,689	113	205,262
Kalamazoo	121	180,565	131	119,972
Lansing	176	243,426	276	812,790
Pontiac	115	171,384	151	216,575
Saginaw	204	168,548	200	146,850
Minnesota—				
Duluth	282	656,547	284	439,165
Minneapolis	921	1,774,075	1,115	2,416,315
St. Paul	692	2,519,232	678	1,700,608
Mississippi—				
Jackson	46	159,100	81	72,000
Missouri—				
Kansas City	621	2,594,872	421	2,397,450
St. Joseph	74	87,260	97	130,890
St. Louis	1,463	9,032,225	1,603	2,111,695
Montana—				
Butte	10	102,895	9	4,480
Nebraska—				
Lincoln	146	326,955	114	193,785
Omaha	320	1,136,362	229	805,910
New Hampshire—				
Manchester	154	268,416	126	151,390
New Jersey—				
Atlantic City*	232	4,183,993	.....	.....
Bayonne	33	174,150	69	1,255,210
Camden	152	495,374	154	239,655
East Orange	106	469,713	141	234,523
Elizabeth	157	494,507	171	536,926
Hoboken	24	65,325	27	52,100
Jersey City	162	1,110,927	186	1,041,866
Newark	549	2,298,639	540	2,774,716
Orange	70	395,233	66	119,277
Passaic	71	278,800	74	362,825
Plainfield	85	260,756	52	324,285
Trenton	179	391,245	245	512,535
New York—				
Albany	637	1,558,399	725	1,195,344
Auburn	31	62,925	46	35,025
Binghamton	391	327,711	443	361,405
Buffalo	979	2,591,712	1,016	2,306,000
Mt. Vernon	87	941,390	114	478,965
New York City:				
Boro Bronx	830	8,369,975	1,016	6,847,838
Boro Brooklyn	2,668	14,747,651	2,105	18,001,662
Boro Manhattan	282	26,315,800	562	23,288,740
Boro Queens	2,504	10,504,005	2,173	13,226,440
Boro Richmond	281	582,216	186	959,690
Niagara Falls	116	397,793	115	282,971
Schenectady	175	980,825	236	695,378

	October, 1924		October, 1923	
	No. of Permits	Valuation	No. of Permits	Valuation
Syracuse	375	902,303	358	942,341
Troy	90	179,000	44	126,303
Utica	85	450,250	257	1,118,312
Watertown	185	164,065	148	98,165
Yonkers	140	893,900	106	1,041,200
North Carolina—				
Asheville	125	650,835	111	283,944
Charlotte	74	652,130	70	272,265
Wilmington	28	79,000	15	19,550
Winston-Salem	241	583,835	193	311,750
North Dakota—				
Fargo	11	21,971	36	226,260
Grand Forks	18	32,925	13	105,250
Ohio—				
Akron	579	878,741	438	697,765
Canton	346	713,586	355	710,562
Cincinnati	1,621	1,825,530	1,705	3,142,455
Cleveland	1,705	5,702,150	1,786	5,733,300
Columbus	652	1,367,600	677	1,345,500
Dayton	372	819,651	349	713,826
Hamilton	101	263,415	67	99,740
Mansfield	89	316,530	76	100,290
Sandusky	63	56,570	60	52,475
Springfield	107	105,010	115	105,775
Toledo	719	1,485,464	648	1,348,419
Youngstown	365	3,082,220	253	515,840
Zanesville	47	101,700	71	334,235
Oklahoma—				
Muskogee	23	25,063	34	69,990
Oklahoma City	162	347,357	152	284,145
Tulsa	225	592,818	130	391,319
Oregon—				
Portland	1,457	2,425,195	1,679	2,136,360
Pennsylvania—				
Allentown	98	536,425	91	501,030
Altoona	187	257,721	187	216,373
Bethlehem	64	164,055	39	107,275
Easton	44	193,690	44	108,087
Erie	273	949,064	180	459,900
Harrisburg	88	469,745	93	486,470
Johnstown	72	498,000	79	896,000
McKeesport	92	245,800	64	93,250
Philadelphia	1,994	12,066,625	1,972	10,949,310
Pittsburgh	847	3,255,584	655	2,061,448
Reading	67	265,350	94	147,300
Scranton	171	542,810	113	212,598
Wilkes-Barre	181	373,954	105	372,029
York	58	639,328	95	255,517
Rhode Island—				
Providence	819	1,716,100	717	2,129,200
South Carolina—				
Charleston	30	22,704	28	69,937
Columbia	125	228,302	101	125,505
South Dakota—				
Sioux Falls	42	91,525	33	64,535
Tennessee—				
Knoxville	416	381,496	333	453,394
Memphis	558	1,699,360	474	1,017,250
Nashville	299	216,064	337	714,916
Texas—				
Dallas	400	2,769,282	340	1,006,380
El Paso	60	55,405	88	98,350
Fort Worth	191	1,282,910	203	931,415
Galveston	284	79,423	372	154,444
Houston	672	1,662,994	654	1,278,529
San Antonio	406	1,637,325	409	568,350
Utah—				
Ogden	35	163,800	34	47,100
Salt Lake City	141	451,041	125	481,955
Virginia—				
Norfolk	167	243,254	197	340,215
Richmond	252	599,132	272	1,828,791
Roanoke	158	171,380	183	436,257
Washington—				
Everett	176	81,625	189	61,675
Seattle	943	2,022,350	976	1,219,270
Spokane	240	259,873	283	183,892
Tacoma	330	507,715	413	275,636
West Virginia				
Charleston	67	140,012	116	294,644

Where the Load is Hard to Start



THE 7½ HP MOTOR

Century

Repulsion Start Induction

Single Phase Motors

should be installed, because the static torque on all sizes is over 275% of the full load torque. This makes them especially well adapted to such drives as pumps, refrigerators, compressors, etc.

⅛ to 40 Horsepower

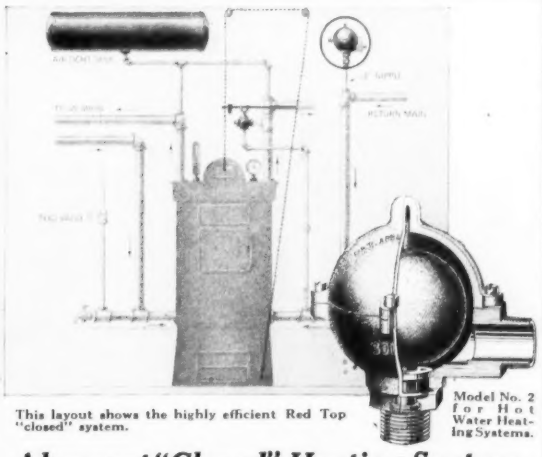
Temperature Rise Not More Than 40° Centigrade

Century Electric Company

General Offices—1827 Pine Street

St. Louis, Mo., U. S. A.

SALES OFFICES AND STOCKS IN PRINCIPAL CITIES



This layout shows the highly efficient Red Top "closed" system.

Model No. 2 for Hot Water Heating Systems.

A low cost "Closed" Heating System

Rapid circulation of hot water, smaller piping, smaller radiators, and a saving of fuel—these are the points in favor of good Hot Water Heating Systems of the "closed" type.

Red Top Relief Valves, the only water relief valve approved by the Underwriters' Laboratories, Inc., are the basis of reliable closed systems.

They relieve pressures at 30 pounds. This valve, with other accessories which may be purchased where you desire, affords an efficient system and avoids the necessity of paying the price asked by manufacturers of "complete" systems.

Our engineering department will gladly aid in solving your heating problems.

NEPTUNE METER COMPANY

50 East 42nd Street New York City

BRANCHES IN ALL THE PRINCIPAL CITIES

Red Top Relief Valve

	October, 1924		October, 1923	
	No. of Permits	Valuation	No. of Permits	Valuation
Huntington	187	410,640	190	394,745
Wheeling	151	421,576	127	626,482
Wisconsin—				
Kenosha	201	342,755	171	265,817
Madison	153	877,080	140	389,767
Milwaukee	823	3,805,359	4,446	6,047,773
Oshkosh	158	200,787	154	108,112
Racine	142	422,403	125	186,372
Sheboygan	216	315,783	156	140,930
Wyoming—				
Cheyenne	28	13,460	21	17,875
Totals	75,153	$292,370,116	78,654	$271,904,653

*No report for October, 1923.

Personal Mention

Walter J. Kohler, president of Kohler Co., Kohler, Wis., and **Herbert Kohler,** treasurer, visited the company's New York office last week. Mr. Kohler, who was accompanied by Mrs. Kohler, stated that he was on business and pleasure bent, as he intends to attend some eastern football games.

C. W. Wanger, president of the Woodward-Wanger Company of Philadelphia, Pa., was recently elected president of the Sales Managers' Club of Philadelphia, a local division of the National Sales Managers' Association of America. This is a signal honor for Mr. Wanger inasmuch as the club is composed of over one hundred of the leading sales managers of Philadelphia.

F. F. Dodds, formerly with the sales division of the American Radiator Company's Kansas City office, has been appointed manager of the Kansas City (Mo.) branch, succeeding R. M. Stackhouse. Mr. Stackhouse has been appointed manager of the Cleveland branch.

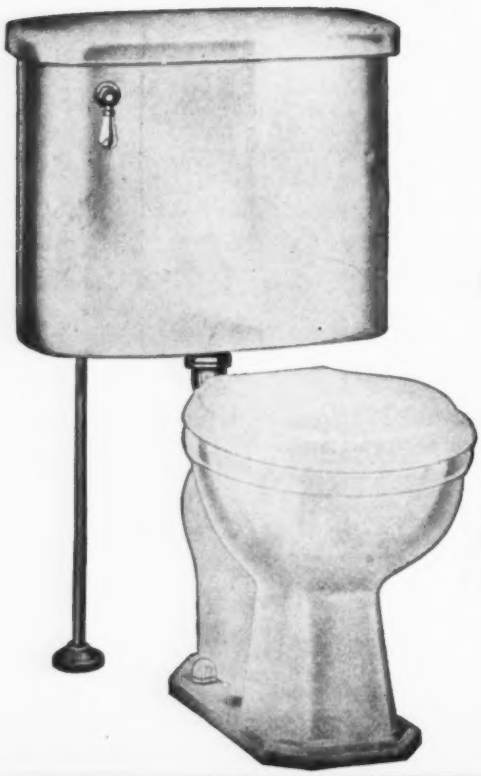
M. W. Wuesthoff, manufacturers' representative, of San Francisco, has been confined to his home for several weeks on account of a bad cold. Mr. Wuesthoff insists he is not paying an election bet.

Roland P. Brown has been appointed director of sales promotion for the Detroit Range Boiler & Steel Barrel Co., of Detroit, to fill the place made vacant by the appointment of Thomas M. Parker as Central States representative for this company. Mr. Brown is a graduate of the University of Michigan and, since the war, in which he served in the Navy, has been connected with the Business Service Corporation of Detroit, the Walker Company and the C. C. Winningham agency, of Detroit.

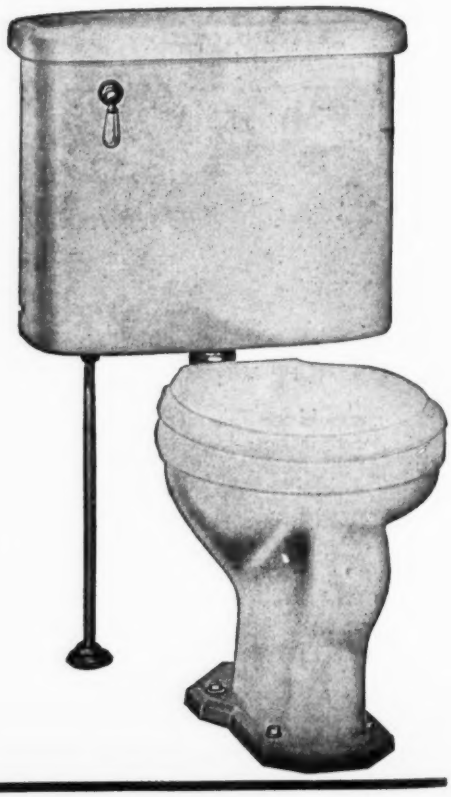
Roland P. Brown

Alan G. Smith has been appointed sales representative for the medicine cabinet department of the Hess Warming & Ventilating Co., of Chicago. He will represent this company in Philadelphia and vicinity.

KALAMAZOO SANITARY MFG. CO.
KALAMAZOO - VITREOUS-CHINA-WARE - MICHIGAN.



YOUR SUPPLY HOUSES STOCK KALAMAZOO TWO FIRED VITREOUS WARE AND KALAMAZOO HYDRAULIC FLUSH VALVES



L. J. Waldear, advertising manager of the Pacific Sanitary Mfg. Co., of San Francisco, Calif., has returned to his desk after a siege of illness due to intestinal trouble.

New Equipment

A New Shower Head

Something new in the line of shower heads is being manufactured by a Pacific Coast company. The new head is made entirely of porcelain and has a removable face to facilitate cleaning, which is its chief feature. The face is fastened to the head proper with a patented bolt connection which makes it water-tight and prevents dripping but facilitates its removal for cleaning purposes. The porcelain will not rust and thus the shower head retains its white and cleanly appearance. Another feature is the swivel joint in the shower arm, which allows the shower stream to be directed at any desired angle. The shower head was recently perfected and patented by a western engineer.

New Trade Literature

Estimated Plumbing and Heating Sales of the United States

A statistical chart—"Estimated Plumbing and Heating Sales of the United States"—has just been prepared and published in pamphlet form by the National Trade Extension Bureau, Evansville, Ind. The survey shows the approximate or estimated number of plumbing and heating shops in each state, and the estimated total of heating, as well as plumbing sales for each state for the year 1924. Statistics indicating potential markets or sales possibilities are extremely valuable to manufacturers and jobbers, and this sales chart is designed to answer the questions often directed to the Bureau as to the probable sales of plumbing and heating material in different sections of the country.

The figures given are based upon the possible production of a journeyman plumber or steam fitter, under normal conditions, and are obtained in the following manner: In 1920, the Bureau made a survey of 5,000 plumbing and heating shops for the purpose of estimating the average amount of business done by each shop per year. This survey indicated that the average volume of sales amounted to about $25,000 each year. An additional fact brought out was that about sixty per cent of this amount went for plumbing, and about forty per cent for heating. It was also found that there were approximately 73,000 journeyman plumbers and 30,000 journeyman steam fitters in the United States. This was an average of 2.1 journeyman plumbers and .8 journeyman steam fitters per shop. It is estimated that the average journeyman plumber is responsible for the sale of about $30 per day, including the cost of material, his own wage, overhead and profit. For the journeyman steam fitter the figure is $47 per day. It is also estimated that the average fitter or plumber works 230 days a year. Thus by multiplying the number of journeyman plumbers in the United States by 230 times $30, the total possible volume of plumbing sales in the United States under normal conditions is obtained.

In order to prove the comparative accuracy of this

A Proven Product

SHERWOOD
No. 66 Ball Cock
Over half a million in daily use, with sales ever increasing are two facts that prove our claims for the dependability of the No. 66 Ball Cock.
A quality product, backed by over forty years of manufacturing experience, it gives exceptionally long and uninterrupted service. Its operation is very quiet, closing positively against pressures up to 150 pounds without the customary whistle or squeal common to most ball cocks.
SHERWOOD BRASS WORKS
Jefferson & Mt. Elliott Aves.
DETROIT, MICH.

The working parts of the Sherwood No. 66 Ball cock dis-assembled

Hot Water!

40 to 1800 Gallons

A constant supply always in storage, maintained at any temperature desired, ready for kitchen, laundry or bath.

ABENDROTH TANK HEATERS

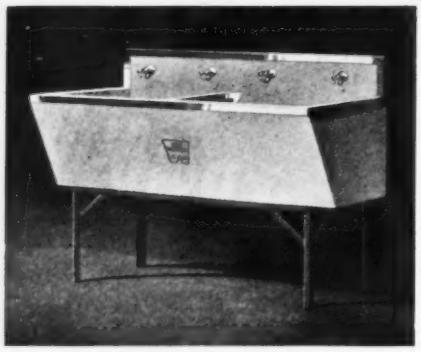
for the Cottage or Large Apartment

ABENDROTH BROTHERS

Established 1840

PORT CHESTER, NEW YORK

Bridgeport New York City Brooklyn



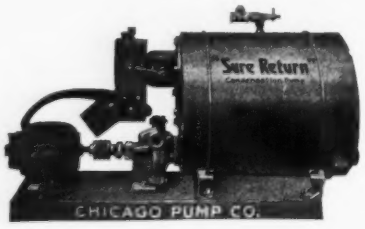
Rounded Rim Corners

CHAS WESELY CO.

As usual, Wesely is first with improvements in concrete laundry tray construction. This time it is rounded rim corners and the elimination of sharp edges, which removes the danger of tearing clothes or cutting the hands. House-wives appreciate this feature.

All genuine "Wesely" Trays are now supplied with this improvement. Be first with the latest. Specify "Wesely" when you order from your jobber.

Chas. Wesely Company
3116-28 S. Canal St., Chicago



"Sure-Return" Condensation Pump.

Ask for Bulletin No. 47.

The Price Is Right

There isn't the slightest doubt about the quality of the "Sure Return" Condensation Pump. It has proven its merit on thousands of installations.

But, in spite of the splendid material and workmanship, that goes into each outfit, these pumps can be purchased at a very reasonable cost.

It will pay you to get our prices.

STOCK DELIVERY

CHICAGO PUMP COMPANY
2322 Wolfram St. Chicago, Illinois

method, the average volume of $25,000 per year is multiplied by the approximate number of plumbing and heating shops in the United States. And by taking 60 per cent of the result for plumbing sales, and 40 per cent for heating sales, figures are obtained which compare reasonably with the previous method.

The total estimated plumbing and heating sales in the entire country for 1924 amounted to $876,773,800, of which $529,957,000 were for plumbing and $346,816,800 were for heating. The average per cent for each month of the entire year's volume is also shown.

This sales barometer or index will materially assist sales executives, wholesalers, manufacturers and contractors in planning sales campaigns for the coming year.

Labor Wage Survey of the Plumbing and Heating Industries

A booklet, entitled "Labor Wage Survey of the Plumbing and Heating Industries," has just been issued by the National Trade Extension Bureau, Evansville, Ind., covering 438 cities and showing the number of shops, the approximate number of journeyman plumbers and steamfitters employed, the rates of pay for the two crafts, and whether the trade is separate or combined. The booklet represents a large amount of labor, time and expense, and it is compiled and published for the sole benefit of associations of master plumbers and heating contractors, who can secure copies of it, as long as they last, for one dollar each.

Economy Boiler Cut-Out

The International Heater Co., of Utica, N. Y., is distributing a circular calling attention to its "boiler salesman that works long hours and draws no pay." The boiler salesman referred to is the company's new boiler cut-out, which, it is stated, is an exact replica of the Economy sectional boiler. The cut-out is made of heavy cardboard, lithographed in five colors, and stands 5 ft. 3½ in. high. It is intended for use in the heating contractor's window display.

Twentieth Century Book of Recipes, Formulas and Processes

A new revised and enlarged edition of "Henley's Twentieth Century Home and Workshop Formulas, Recipes and Processes" has just been published by The Norman W. Henley Publishing Company, 2 West Forty-fifth street, New York City. This volume contains over 10,000 practical recipes, trade secrets, chemical processes, scientific formulas and money-making ideas. Among the subjects of interest to the trade are alloys for copper, nickel, zinc, tin and aluminum; formulas for making brass, for coloring unpolished brass, for black finish on brass. Under the heading "Cleaning Preparations and Methods" are given formulas for removing enamel and tin solder, preparations for cleaning and polishing marble, rust removers, steel cleaners, cleaners for brass, bronze, nickel, etc. The various stages of an enameling process are described in another section, as is also the process of japanning tin, and preparing aluminum and brass varnishes. Formulas for various kinds of lubricants are given in another article. A section is devoted to metals, and under this heading are explained processes for brightening and deadening metals, coloring and plating metals, etc. A number of pages contain many formulas for solders for copper, brass and aluminum, fluxes for soldering, gas soldering, etc. This book consists of 800 pages, printed in large, clear type and bound in red cloth. The price is $4.

T. G. Irwin has moved his plumbing and heating shop from 1021 Lake street, Oak Park, to River Forest, Ill.

What Then

When One out of every Ten Is Burning Oil

THOSE who ought to know, say that it will only be a short time before one out of every ten houses will be burning oil.

How about it, will the boiler you *now* sell be giving satisfaction *then?*

Has it a long fire travel, or just the usual one?

Short travel boilers make long oil bills.

Long travel ones make short ones.

Boilers that do fairly well with coal, fall down with oil. The pressure it burns under, drives the hot gases at a faster gait to the chimney.

Only a long fire travel boiler can get the greatest value out of the oil burned.

There is no boiler made with a longer fire travel than the Burnham.

Truth to tell, we don't happen to know of one that is anything like as long. Do you?

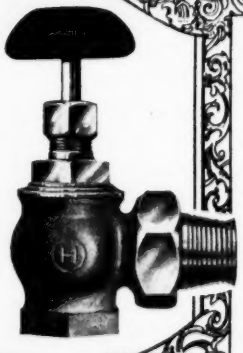
Burnham Boiler Corporation

IRVINGTON, NEW YORK

Representatives in all Principal Cities

Canadian Offices: Harbor Comm. Bldg., Toronto. 124 Stanley St., Montreal

HAMMOND VALVES



It's an easy matter to claim one's product is better than others selling at the same price but unless the claims can be proved—"it doesn't mean anything."

We claim that Hammond Radiator Valves *are* better and welcome an opportunity to show you why. Or you can make a comparison yourself. Order a trial lot from your jobber.

TRADE H MARK

HAMMOND BRASS WORKS
Hammond, Indiana

WEISTEEL COMPARTMENTS

FINISH the job complete, yourself on your toilet installation jobs. Weisteel Compartments are so easy to erect there's no reason for your passing up the substantial extra profits that can be yours. And that's not all—you give your customer a better job—more sanitary, more durable and very much more economical both in first cost and maintenance.

You have everything to gain and nothing to lose by writing our nearest office for complete data.

Henry Weis Manufacturing Co.

Main Office and Factory: ATCHISON, KANS.

Chicago, 105 W. Monroe St. New York, 110 W. 34th St.
Boston, 8 Beacon St. Los Angeles, 616 S. Utah St.

November 26, 1904

Republic Manufacturing Co. Incorporated.—The Republic Manufacturing Company, of Chicago, has been incorporated with a capital of $50,000 to manufacture plumbing goods. The incorporators are Howard W. Hayes, John S. Goodwin and Robert W. Dunn.

Dececo Company to Have New Building.—The Dececo Company, of Boston, Mass., will soon occupy the building at the corner of Fort Hill Square and Oliver street, in that city. The new location will largely increase the floor space and facilities of this company.

Crane Co. Expanding.—Crane Co., of Chicago, has laid the foundation for a new five-story general office building at the corner of Twelfth place and South Canal. A new branch house has been opened at Dallas, Tex., and another new branch house has been opened at Memphis, Tenn.

Royal Palace in Pekin to Have American Plumbing Fixtures.—The Standard Sanitary Manufacturing Company, of Pittsburgh, Pa., has recently received an order for several modern plumbing fixtures for installation in the palace of the Empress of China, in Pekin.

Indianapolis Master Steam Fitters Incorporated.—The Master Steam and Hot Water Fitters' Association, of Indianapolis, Ind., has been incorporated with a capital stock of $2,500.

United States Radiator Company to Build Addition.—The United States Radiator Company, of Dunkirk, N. Y., has lately closed a contract for a very large addition to its plant. Work on this contract has already commenced.

Provincial Association of Master Plumbers of Ontario in Convention.—The Provincial Association of Master Plumbers of Ontario held its semi-annual convention at the rooms of the Toronto association, on November 17, the Thanksgiving Day of the Dominion. The delegates who represented the National Association of Canada at the convention of the National Association of Master Plumbers of the United States at St. Louis reported about the work done there.

Secures Patent.—Michael D. Helfrich, of Evansville, Ind., has recently secured a patent on a water closet bowl.

Large Plumbing Contract.—Armbrust & McGurk, of Philadelphia, have been awarded the contract for plumbing thirty-three new houses for the Lafferty estate, Philadelphia.

President Craig Announces Board of Directors.—President David Craig, of the National Association of Master Plumbers, has officially announced the appointment of the following Board of Directors for the ensuing year: E. D. Hornbrook, of Kansas City, Mo.; W. B. Coffee, Tacoma; Joseph A. Weldon, Pittsburgh; Thomas J. Young, Mobile; R. B. Moodie, Dayton; Chris. Irving, Denver; Alfred Gawthrop, Wilmington; T. A. Hill, New York City; C. Aneshaensel, Indianapolis; James H. Aitken, New Orleans, and W. F. Wilson, of San Francisco.

The O-E Improved Air Exhauster and Vacuum Valve

—the third of the three simple fittings that make the most efficient heating system ever devised.

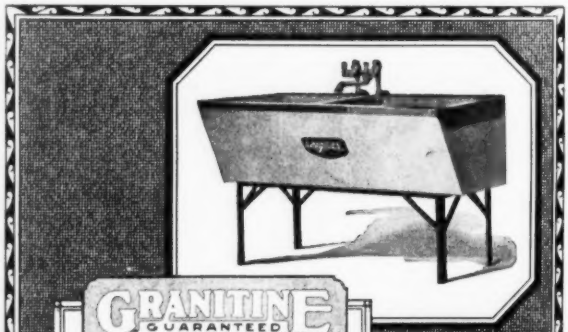
It opens automatically when there is any air in the system and closes quickly and positively as soon as it is expelled.

It is simpler than other devices made for such service and never fails to operate. It cannot buckle and cannot stick. Every one is tested by vacuum before shipping.

Write us for booklet "A" which tells the whole "O-E" story

O-E Specialty Mfg. Co.
10 Keefe Avenue
Milwaukee Wisconsin

TRADE MARK



GRANITINE GUARANTEED LAUNDRY TRAY

A MIGHTY good name to remember when you order laundry trays from your jobber.

Granitine laundry trays are guaranteed, strongly built and well crated.

Is the GRANITINE trade mark on the trays you buy?

Factories in Chicago Cincinnati and Omaha

Chicago Granitine Mfg. Co.
CHICAGO, ILLINOIS

CHICAGO

It is claimed by one man prominent in plumbing and heating in Chicago that prosperity is a state of mind. If that be true it should not be long before these trades enjoy their fill of business, for confidence in the outlook has been written in large letters in various departments of the market in plumbing and heating supplies. Stable conditions lead to business opportunity, and although there may be some dissatisfaction with business conditions as they are found right now, it would be difficult to discover anyone in the trade who would agree that this dissatisfaction is due to uncertainty.

Many lose sight of the fact that business in plumbing and heating as well as in other lines is still suffering some of the pains of adjustment which were inevitable and which have been experienced since 1921, but, fortunately, instead of the adjustments coming in a single stroke, the process has been gradual and without serious consequence. In fact, the middle of 1925 will probably be here before it is known how far-reaching such adjustments will be. But the first evidence of increasing orders based on this optimistic outlook will doubtless send a quickening impulse through the arteries of trade with the result that the monthly totals of the next few months will indicate that the period of adjustment is a matter of history.

In the meantime, the high prices attained by stocks, the fact that copper consumption has been proceeding at a higher rate than ever before recorded, the increased demand and recovery of prices of pig iron support the confidence that is expressed in the present business situation. Some raw materials in the meantime, including lead, copper and brass have also shown a gain since that time and advances are being predicted in many fields. Price advances were features in the last few days in the iron and steel industry. Retail yards dealing in building material also advanced prices of the staple items of pine and fir building lumber following advanced replacement costs.

Soil Pipe

Makers of soil pipe have been mainly concerned during the last few days in getting in specifications on the covering orders they have received from jobbers and getting off shipments of the remaining tonnage on their books for delivery. There is very little new buying at present as most jobbers have closed on their requirements during the last few weeks of price adjustments. Foundries generally are running part time, with some idle; and foundry stocks that have been built up in the past are in the main sufficient for the business that has been placed.

Steel Pipe

There is still very little forward buying of pipe in this district but demand, though showing the usual seasonal let-up, is holding up quite well. Jobbers are maintaining stocks adequate to meet all calls promptly. Makers report no trouble on deliveries and anticipate no shortage in this commodity. Prices remain unchanged.

Wrought Iron Pipe

Jobbers' stocks of wrought iron pipe are conservative but in condition for present demands. Makers report that November has been a month of satisfactory business for them, saying that, while there are very few jobbers placing orders for future shipments, they cannot complain about the present. Deliveries can be made within ten days of receipt of order.

Enameled Ware

For the first time in two years, one maker says, enameled ware manufacturers have caught up on back orders and are in a position to make prompt shipments from stock. Reports from the Department of Commerce show that makers had 88,980 bathtubs in stock in October, 1924, as compared with 30,429 in October, 1923, and unfilled orders for 77,444 bathtubs in October of this year, as compared with 193,805 in the corresponding month of last year. Jobbers' stocks generally are low and hesitation is still apparent in their forward buying. Prices are firm.

Pottery

Some potteries have no complaints to make about business. They are operating right along and from their regular customers are getting a steady run of business. Others are accumulating stocks and find business a little slow at this time. In general, this commodity reflects the same hesitation about forward buying as is noticed in other commodities. Prices are unchanged.

Range Boilers

With delivery dates for range boilers beginning to approach post-inventory season, most manufacturers are optimistic in feeling that demand will pick up in the near future. The past few days have brought little change in the actual orders received, however, the volume of business still being light. Jobbers report a quiet demand from the master plumber and have stocks sufficient for their requirements.

Plumbers' Brass Goods

Prices of plumbers' brass goods are going through a stage of adjustment in the Chicago territory. There are several cases of withdrawals of prices, one instance at least of a definite advance, and many of no changes. The result is that there will be a more common level of prices than has been in effect for some time. Many jobbers have inquiries out for future needs, with some makers reporting good orders closed and all feeling that good business is just around the corner. Present business has been light for the last few days, most jobbers having adequate stocks for this season.

Boilers and Radiators

While there is not very much new business coming in at this time, makers seem satisfied. They predict a busy season for the first six weeks after the real cold snap breaks in this territory. One leading manufacturer reduced the price ten per cent on a hot water heating outfit for small homes, but prices in general remain unchanged. Deliveries are prompt in most cases.

NEW YORK

Business is not very active at present in the Greater New York district, the demand being described as fairly good in most lines. Manufacturers continue to place implicit confidence in the prospect for the coming months, however.

The fact that some prices have stiffened supports this confidence and has, in some cases, caused jobbers to place orders at present prices for as far into the future as manufacturers will permit. This condition is not general, however, most jobbers hesitating about buying for either immediate or future delivery until the inventory season has shown them just where they stand.

Recent reports from Wall Street show that the stock market is at a peak point and that prices in stocks are still soaring. This activity is regarded by many as an indication that items in various lines of manufacture are likely to become firmer or rise in price.

Soil Pipe

Soil pipe demand has increased measurably during the past two weeks and is just beginning to slacken. Prices seem established at the new level, and most jobbers have closed on their requirements for some time to come.

Steel Pipe

The trade is wondering whether an advance in the price of steel pipe is likely to follow the recent rise in prices in other steel products. Independent makers say that so far as they are concerned, no rise is expected. Demand is good for this season. Deliveries are also good.

Wrought Iron Pipe

Demand is reported as very good for this season in wrought iron pipe, the past month having shown a very satisfactory volume. Prices remain unchanged and are firm. Deliveries are good.

Enameled Ware

There has been no change in the enameled ware situation during the past week. Demand remains fair and prices are unchanged. Manufacturers are able to make good deliveries on most articles.

Pottery

Demand is reported to be slow as is usual at this season. Deliveries on staples are good, but deliveries on specials sometimes run as long as three months.

Range Boilers

No change is reported in the range boiler market. Prices are somewhat stiffer but no change has been announced. Demand is still only fair. Deliveries are good.

Plumbers' Brass Goods

Although some makers of plumbers' brass goods report a rise in prices others report no change. Demand is also variously reported as showing a marked increase and as remaining the same. Deliveries are good from most makers.

Boilers and Radiators

Demand is still fairly good in boilers and radiators, although the demand for boilers is falling off to some extent. Prices are unchanged. Deliveries are good.

PHILADELPHIA

Bankers' reports and building permits issued for large and small buildings during the past month, are indicative of good business for the master plumbers and heating contractors of the Philadelphia district during the coming seasons. Building permits were unusually large for November.

While work on new operations has fallen off to a considerable degree, the recent setting in of cold weather has given the repair man and the man who specializes in renewals of heating equipment more than he can handle for the time being, in fact all master plumbers and heating contractors are busy at present.

Some jobbers report that they are still waiting to see the direction prices are going to take before laying in large stocks. The result of this attitude and of the inventory season is that orders for most commodities are of the hand-to-mouth variety.

Soil Pipe

Demand has shown a marked increase as a result of the recent rise in price. Deliveries are from fair to good.

Steel Pipe

Steel pipe prices are firm and unchanged. Demand and deliveries are good.

Wrought Iron Pipe

Makers report an excellent demand for this season and are optimistic for the coming months. Jobbers' prices are not very steady. Makers' prices are firm. Deliveries are good.

Enameled Ware

Jobbers are not buying heavily for stock in enameled ware but day to day orders are sufficient to warrant the statement that business is good, according to the makers. Prices are firm. Deliveries are very good again.

Pottery

Manufacturers say that they are experiencing the seasonal decline in demand for staples but that they are expecting the usual flood of orders after January 1. Deliveries on staples are good, specials taking from one to three months.

Range Boilers

Although some manufacturers claim that there has been an increase in the cost of making range boilers, prices remain unchanged. Demand has shown no increase. Jobbers' stocks are from low to fair. Deliveries are excellent.

Plumbers' Brass Goods

Price conditions are still unsettled, according to some manufacturers. While some makers have advanced prices, others have not. Demand is slightly improved due to the somewhat strengthened market. Deliveries are good. Some jobbers are ordering ahead at present prices.

Boilers and Radiators

Demand continues good in boilers and radiators. Lowered prices have induced some jobbers to stock quite heavily on radiators. Deliveries on most articles are good.

PACIFIC COAST

There seems to be a growing spirit of optimism among the trade as to the outlook for future business on the Coast. Business in all lines is increasing and various bank and trade reports covering all lines of activities are very optimistic in tone. Buying by jobbers is confined mostly to first quarter delivery and is along conservative lines.

There is only one dark spot in Coast business at present and that is the unsettled condition of jobbers' prices to the trade in some of the large jobbing centers on the Coast.

Soil Pipe

The demand for this commodity is increasing. Most jobbers' stocks are in fair shape and in condition to fill present requirements with considerable tonnage ordered for January delivery. Some jobbers, however, anticipating increased demand, have released their orders for immediate shipment.

Steel Pipe

Business as a whole on steel pipe may be said to be good. Most jobbers' stocks are in good shape. Some

jobbers state that they notice a slowing up of delivery by some of the manufacturers.

Enameled Ware

The demand remains fair. Sales by jobbers, however, are mostly in small lots for immediate delivery. Coast manufacturers state that a fair amount of new business is being received and the outlook, as a whole, is encouraging.

Pottery

Sales on pottery are about normal. Jobbers, in most instances, have ample stocks for present requirements. Coast potteries, as a whole, are busy and report a fair amount of new business being received.

Plumbers' Brass Goods

There seems to be an increase in buying of this commodity, especially of higher quality material. Jobbers' stocks, in most instances, are ample for present requirements, and no difficulty is experienced in receiving prompt shipment of factory orders.

Range Boilers

There is a fairly steady demand for range boilers at present. Jobbers' and manufacturers' warehouse stocks are in fair shape and no difficulty is experienced in receiving prompt shipment on factory orders.

NEW ENGLAND

The continued strength of the metal market, followed by a continuance of the stiffening in prices in plumbing and heating goods, especially in brass products, has been the cause of extensive buying both by the jobber and his trade. While at this season it is usually customary for master plumbers and heating contractors to curtail buying, orders being entered for delivery beginning January 1 for the first quarter of the year. No reductions are looked for and the price cutting that was in evidence a short time ago is entirely eliminated. Raw materials show no evidence of dropping; labor cannot well be cut down; overhead shows no decrease and all indications point to strong markets in the Spring. Building permits, even at this late season, show little falling off and very good business for the coming year seems to be assured.

Optimism is general in this territory. Money which has been very difficult to obtain is becoming easier, overdue collection lists show a reduced number of names and conditions in general are causing a much better mental condition and more of a desire to place orders. The statement of many of the business men in this market is that one of the best business years that have been seen is expected in 1925.

Soil Pipe

There has been no change in prices since the latest advance of about a week ago. Both the Northern and Southern foundries are at present quoting the same prices. Jobbers are buying heavily, according to reports, and many of the trade have entered orders for shipment after January 1, protecting themselves against advance. The demand for prompt delivery is better than for some time past indicating that actual requirements, as well as a small surplus for stock are being taken care of. Jobbers' stocks are as a rule fairly well assorted while shipments from foundries are coming through promptly.

Steel Pipe

Prices remain the same. A good buying movement is in progress and orders are being entered with the mills for the first quarter of the year. Jobbers' stocks are being kept at a good level both as to assortment and quantity. Demand from the master plumber and heating contractor is very good both for prompt and future de-

Goods You Can Tie To

It pays to be sure of the brass goods you handle and install.

Trenton Products

have proved their superiority by actual use. The kind you can install and forget about.

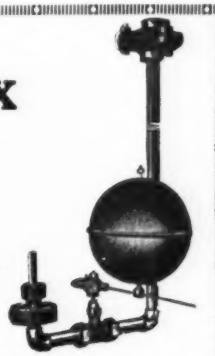
The Trenton Wash Tray Plug is made in a variety of patterns. Finished brass or nickel plated.

Order from your jobber.

THE TRENTON BRASS AND MACHINE CO.

Trenton, New Jersey

The Climax Cellar Drainer



Why use uncertain and costly waterproofing of cement, asphalt, tar, etc., when the CLIMAX Cellar Drainer is so positive, dependable and inexpensive? The CLIMAX is usually installed in the end; why try something else in the beginning?

THE C. M. KEMP MFG. CO.

405-413 E. OLIVER STREET

BALTIMORE, MD.

Pacific Coast Agents: Wm. P. Horn Co.

Rialto Building, San Francisco, Cal.
Kercheff Building, Los Angeles, Cal.
Deekum Building Portland, Ore.
L. C. Smith Building, Seattle, Wash.

Armstrong
Twin Jaw
CHAIN PIPE WRENCH
PROOF TESTED
Write for catalog

POINTS OF EXCELLENCE
Extra large master bolt.
Alloy steel shackle links.
Two bolt fastening.
Extra large bearing of Jaw on Bar.
Spreading of Jaws prevented by bolt directly below chain socket.
Chain guides aid in adjusting chain. Chain and end bar protected by chain guide.

ARMSTRONG BROS. TOOL CO.
323 N. Francisco Ave. • Chicago, U. S. A.

BUY O·B VALVES
O·B VALVES are built to stand the heavy strains
The Ohio Brass Co
Mansfield, Ohio, U.S.A.
New York City — Chicago — Philadelphia
Los Angeles — Seattle — Portland — San Francisco

Specify **Eagle Roof Flanges**

Made of drawn lead.
No blow holes or laminations.
Caulking ring is spun to triple thickness.
Boot is lead-burned to apron, not soldered.
Adjustable to all pitches of roof.
The heaviest roof flange on the market.
Extra large apron.
Will pass all city ordinances.

Cataloged in Sweet's or send for our Eagle Lead and Mixed Metal Catalog

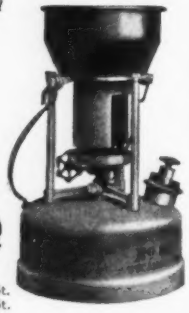
The EAGLE-PICHER LEAD COMPANY
CINCINNATI CHICAGO JOPLIN

TURNER UTILITY FURNACE

Only 2 openings in tank—Safety Valve—Special Composition Bronze Burner.

Operates perfectly on gasoline or kerosene. Combined pump and filler plug. Bronze spider support eliminates unnecessary tank holes. Safety Valve prevents excess pressure. Most durable furnace made. FEARLESSLY GUARANTEED.

And—Get TURNER No. 45 BLOTORCH—*it's Safe.*



THE TURNER BRASS WORKS
Lincoln St. Sycamore, Ill.

DISTRICT REPRESENTATIVES
San Francisco ..... Rice-Hitt Co., 623 Larkin St.
Los Angeles ..... Rice-Hitt Co., 324 N. San Pedro St.
Seattle ..... Rice-Hitt Co., 1427 L. C. Smith Bldg.
New York ..... The Turner Brass Works, 108 Charlton St.

No. 66. 7'pint capacity

livery. Mills are slowing up slightly on shipments but no shortage seems likely.

Wrought Iron Pipe

There is a fairly good demand for this commodity especially for the smaller sizes. Jobbers' stocks are well assorted and ample for all demand. Prices have not changed.

Enameled Ware

The situation is unchanged. Active buying for future delivery still hesitates. A good steady demand is in evidence but not in large volume. Jobbers' stocks are being held at a good level for present demand.

Plumbers' Brass Goods

Practically all manufacturers of this commodity have withdrawn prices and advances reported vary from 5 to 12½ per cent. A good buying movement is reported and both jobbers and master plumbers are placing covering orders. The demand has been strong enough to reduce jobbers' stocks appreciably.

Pottery

The demand on the makers holds up well and many jobbers have ordered pottery for both prompt and future delivery. The demand on the jobber, also, is better than it has been for several months. Potteries report a larger volume of business on their books than they have had for over a year.

Range Boilers

No price change has been announced. Demand holds up well with jobbers' stocks ample for all orders received.

Boilers and Radiators

Demand holds up well and jobbers' stocks are requiring replacement orders. A leading manufacturer reduced the price 10 per cent on a hot water heating outfit for small homes, but, in general, prices remain unchanged.

The Metal Market

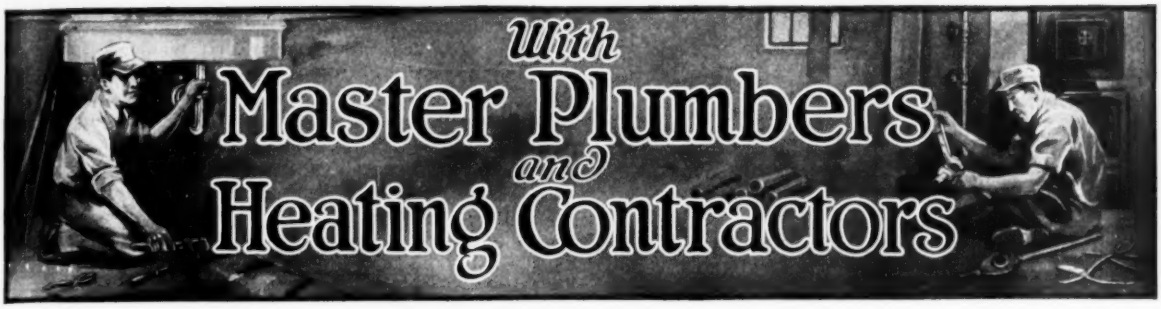
	Nov. 18	Average Oct., 1924	Average Aug., 1924	Average 1923
PIG IRON—				
No. 2 Foundry, Chicago, fur.	$21.50	$20.50	$20.40	$28.72
PLATES AND SHEETS—				
Steel boiler plates, Pittsburgh, per lb.	1.90c	1.80c	2.00c	2.18c
Blue annealed sheets, Pittsburgh, per lb.	2.70c	2.60c	2.70c	2.50c
Black annealed sheets, Pittsburgh, per lb.	3.60c	3.40c	3.50c	3.75c
Galvanized sheets, Pittsburgh, per lb.	4.75c	4.60c	4.60c	4.32c
TIN—				
Straits tin	54.37½c			42.71c
COPPER—				
Prime Lake, delivered	14.00c			14.96c
Electro, f. o. b. refinery	13.65c			14.61c
LEAD—				
Chicago	9.00c			7.35c

The Old Metal Market
Dealers' Buying Prices

	Per lb.		Per lb.
Aluminum clippings	17 c	Copper, light	9 c
Block tin	38 c	Copper, uncrucibled wire	10 c
Brass, light	6¼c	Faucets and valves	7½c
Brass, heavy mixed	7½c	Lead, heavy	5¾c
Brass, red	8 c	Solder joints	6½c
Copper, crucible	11 c		

NOTE: The range of price is not given. The prices quoted represent the low point of spread on Tuesday of this week.

Genser & Sons, of Higginsville, Mo., have the heating and plumbing contracts on the new dormitory at St. Paul's College at Concordia, Mo. The contracts amount to $20,000.



PRESIDENTIAL SPECIAL TO THE NATIONAL CONVENTION AT PORTLAND, OREGON

John J. Vogelpohl, of Cincinnati, Ohio, president of the National Association of Master Plumbers, has just issued the following announcement:

To Members and Their Friends:—The very much anticipated opportunity to combine business with pleasure on the trip to the Pacific Coast to attend the annual meeting of the National Association of Master Plumbers of the United States at Portland, Ore., June 23, 24 and 25, 1925, has arrived.

Arrangements have been made with the Chicago and North Western, Union Pacific, and Denver, Rio Grande and Western Railroads to convey our delegates and their friends to Portland, and an itinerary which includes stop overs at Denver, Colorado Springs, Salt Lake City and sight-seeing trips at these points has been arranged which we expect will render the trip one of the most enjoyable and memorable of your experience.

For the comfort and convenience of our members and their friends we have arranged for special equipment, which includes Standard Pullman compartment, and combination compartment and drawing room cars, buffet baggage car, dining cars and full observation cars. One train will start from Cincinnati and the others from Chicago. In order that all who contemplate attending the convention may know at the outset the cost of the trip, I have appointed P. A. McKenna, Executive Clerk, Cincinnati, to act as director of transportation for the trains starting from Cincinnati, Ohio, and Jos. W. Cannon, Thos. F. Hanley and Peter M. Munn, of the Chicago Association, to act as directors of transportation for the train or trains starting from Chicago.

These gentlemen have given much time and study to provide comfort and entertainment for the members enroute to the convention. Each of our special trains will be equipped with a well stocked commissary. The itinerary is the result of the committee's efforts and amply provides for all members and their friends who will travel on our Special DeLuxe Trains.

Aside from having our directors of transportation with us to look after transportation arrangements on our Special trains, they have also arranged to have courteous and experienced railroad representatives accompany us to assist us in making this the best trip ever enjoyed by members and delegates to a National Convention.

With the Special trains you will get all the delights of travel without annoyances. No need to worry or fret about railroad connections, reservations, etc., for everything is arranged and the cost is included in the "All-Expense" plan which your committees have adopted.

You have the option of selecting the route for the return rail trip that has the most appealing attractions. It was on account of the diversified places of interest that could be visited on the return trip that the committee left same open to your choice.

The Special Train arrangement will afford us an opportunity to get together enroute before the convention. Besides getting the benefit of a most enjoyable outing, it will bring together master plumbers from all over the United States, enabling members to meet and renew old acquaintances, form new friendships and promote their many interests in an atmosphere of sociability and good fellowship.

Each member will select the route most convenient from his home to Cincinnati or Chicago and should arrange departure schedule so as to reach those points in ample time to board the special trains.

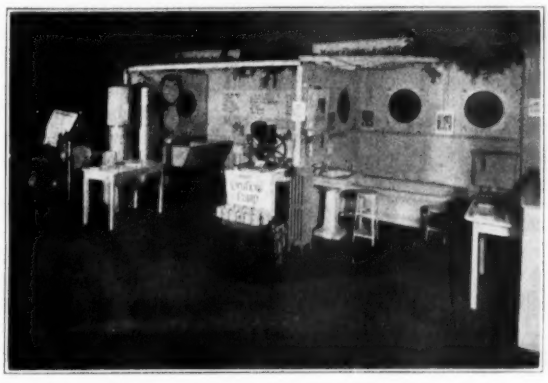
Reservations for Special starting from Cincinnati should be sent to P. A. McKenna, 4125 Hamilton avenue, Cincinnati, Ohio, and for the Chicago Special to Peter M. Munn, 111 N. Dearborn street, Chicago, Illinois. The earlier you send in those reservations the better it will be as it will enable the transportation committee to make intelligent arrangements and provide necessary equipment.

Anticipating the pleasure of having you accompany the Presidential Special to the Pacific Coast next June, as it will be a trip that will enable you to attend the National Convention and provide an ideal vacation trip for yourself and family, I am Sincerely yours,

John J. Vogelpohl, President.

WASHINGTON ASSOCIATION OFFERS OREGON ASSISTANCE IN CARING FOR NATIONAL CONVENTION

At the November 1 meeting of the executive board of the Washington State Master Plumbers' Association, a resolution to aid the Oregon Master Plumbers' Association in every way possible, in their plans for the 1925 national convention, was passed unanimously. A telegram offering the services of the Washington organization for "anything we can do," was sent to Chas. M. Fullman, chairman of the convention committee.



The exhibit of the Master Plumbers' Association of Dayton, Ohio, at the Greater Dayton Building Exposition held recently in that city

A. S. H. & V. E. DECIDE ON DATE FOR ANNUAL MEETING

The annual meeting of the American Society of Heating and Ventilating Engineers will be held January 28, 29 and 30, at the Copley-Plaza Hotel in Boston, Mass. The election of officers will take place January 27 at the society's offices, 29 West 39th street, New York City.

H. & P. C. N. A. DIRECTORS TO MEET

The Board of Directors of the Heating and Piping Contractors National Association will meet at the New York offices of the association on December 8.

SOUTH DAKOTA MASTER PLUMBERS TO MEET WITH CONTRACTORS

The South Dakota Retail Plumbers' Association will hold its annual convention jointly with the General Contractors of South Dakota in Mitchell, S. Dak., January 6, 7 and 8, 1925.

ALABAMA MASTER PLUMBERS TO MEET IN BIRMINGHAM

The Alabama Master Plumbers' Association has decided upon Birmingham, Ala., for the 1925 convention, which will be held some time in April, according to information recently received from Secretary R. Reeves.

NOVEMBER MEETING OF NEW YORK CHAPTER OF A. S. H. & V. E.

Fuel oil and fuel oil burners were the subjects taken up by the New York Chapter of the American Society of Heating and Ventilating Engineers at its regular monthly dinner meeting at the Building Trades Club, New York City, held Monday evening, November 17, the speakers being Commissioner Wm. E. Walsh, chairman of the Bureau of Standards and Appeals, New York City; Robert P. Adamson, president of the Petroleum Heat and Power Co. and formerly Fire Commissioner of New York City; F. W. Staley, of the Texas Co., New York City, and Mr. Horning, combustion engineer for the Standard Oil Co. of New Jersey.

After Commissioner Walsh had promised the assembled engineers the fullest co-operation from his office in their efforts to secure consideration for their oil burner installation plans, Mr. Adamson gave a complete history of the burning of heavy oils for fuels.

Mr. Adamson's experience has been principally with the type of oil which requires pre-heating before it is used, and is for this reason adaptable only for marine work, large buildings and the like. He told the assembled engineers that Providence, Boston, Los Angeles, New Orleans, and San Francisco were the largest consumers of this type of oil in the country at this time, the west coast cities having been particularly fortunate in the use of this for fuel. In New York City, which is rapidly coming to the fore with installations burning this type of oil, about 500,000 tons of coal are being replaced each year by the fluid.

Some of the obvious advantages of oil burning besides the ones of comfort and less labor, he said, are:

1.—The burning of oil will actually increase the rating of boilers used, as a higher rate of efficiency can be gotten through the use of this fuel. This increase in efficiency ranges from 25 per cent to 50 per cent.

2.—Oil will hold peak loads where it is almost impossible to build up a hot enough fire with coal to reach the maximum of efficiency necessary to use.

3.—Oil is as safe as coal when properly taken care of.

However, oil burning installations can be carried on successfully only by trained engineers, in Mr. Adamson's opinion. He feels that the present tendency for every Tom, Dick, and Harry to start the manufacture and installation of oil burning equipment is a serious menace. He advised his hearers to apply their engineering knowledge to any oil burning problem that might present itself.

The economic factor will determine the future of the oil business is this expert's opinion. If time shows that burning oil is cheaper than coal, oil will take a definite place in the scheme of things. If, however, coal is proved the cheaper fuel, oil equipment will gradually lose out.

Mr. Horning described the difference between furnace and distillate oils, giving the flash point, firing point, and the rate of efficiency compared to coal of each. After describing typical oil installations, he told his hearers that 2,000 domestic oil burners had been patented. Six hundred makers have applied to the Board of Underwriters for approval, but up to the first of this year only a dozen or more had been approved. On an average it takes 130 gallons of furnace or distillate oil to equal a ton of anthracite coal, he stated that investigation had proved. At this ratio, furnace oil at 9½c per gallon would be equal to coal at $12.50, and distillate at 6½c would equal coal at $8.50 per ton, in addition to approximately $5.00 a ton required for handling, ash removal, etc., which is not necessary when using oil.

Mr. Staley emphasized the fact that the method of the installation is the most important, and that another factor to be considered is the design of the combustion chamber of the furnace.

MODERN PLUMBING STORE IN CALIFORNIA

Wm. Ehlert, 1000 Alameda street, San Jose, Calif., started to learn the plumbing trade at the age of 14, working for Christian Hirth, and served as a journeyman for 22 years. Eighteen years ago he went into business for himself with one set of fixtures as stock in a small

The plumbing and heating establishment of Wm. Ehlert, 1000 Alameda street, San Jose, Calif.

shop in San Jose. Later he moved into better quarters at 287 North First street in that city and steadily increased his business until he found it necessary to erect the handsome building shown in the picture. The structure cost $18,000 and contains a modern display room, service department and shop.

NEW SECRETARY OF CALIFORNIA SANITATION DEVELOPMENT LEAGUE

At the regular meeting of the board of directors of the California Sanitation Development League of San Francisco, Calif., W. H. Barry, who has been assistant secretary of the league, was chosen as secretary to succeed the late B. N. Coffman. At this meeting resolutions were passed in memory of Mr. Coffman.

CALIFORNIA SANITATION DEVELOPMENT LEAGUE ON ITS TOES

Members of the California Sanitation Development League of San Francisco, Calif., are making a survey of all public comfort stations and retiring rooms in their territory and will make a report to league headquarters. Letters will be sent to the owners of buildings where unsanitary conditions are reported, calling their attention to the conditions and suggesting they call in their plumber and remedy the evil. If no response is received in a reasonable length of time, the report will be turned over to the city health officer who has offered to co-operate to the fullest extent in eradicating uncleanliness. The San Francisco Health Department has given this campaign its heartiest recommendation.

SAN JOSE MASTER PLUMBERS ORGANIZE

Master plumbers of San Jose, Calif., have organized a new association at a meeting called by State President Harry G. Newman, of Oakland, Calif., on November 18. Thirty members of the craft attended the meeting and most of them turned in their applications. J. C. Greenberg was the speaker of the evening, and he was ably seconded by C. C. Newkirk, field man for the California State Association; A. J. Wilson, national director of San Francisco; President Newman, and Wm. F. Serpa, of San Jose. The following officers were elected: E. F. Waters, president; Harry Pascoe, vice-president; C. A. Merritt, secretary, and E. Tarplee, treasurer.

SPEAKS AT SEVERAL CALIFORNIA MEETINGS IN PLACE OF COL. ARCHER

Arrangements have been made by the California State Master Plumbers' Association to have J. C. Greenberg speak at some of the meetings in the state in place of Col. W. G. Archer, of the National Trade Extension Bureau, who was recently called East by the death of his wife. State President Harry G. Newman and W. H. Barry, assistant secretary of the California Sanitation Development League, will accompany Mr. Greenberg on his itinerary.

November 15, Salinas was visited; November 17, Oakland; November 18, San Jose; November 19, San Mateo; November 20, Santa Rosa; November 21, San Francisco, and November 22, Fresno.

In his address to the Marin County, Calif., master plumbers, Mr. Greenberg's "pinch-hitting" for Col. Archer was especially successful in that a local was organized then and there. This was on November 14. After a good dinner at the Monogram Cafe, Mr. Greenberg told the masters assembled of the advantages of membership in the state and national associations. He illustrated his talk with chalk and a blackboard, and left no doubt in the minds of his audience as to the desirability of forming a strong local organization.

After Mr. Greenberg had finished, W. H. Barry took the floor and delivered a few clinching arguments, following which the master plumbers signed and turned in their application blanks, and thus the Marin County Master Plumbers' Association was an established fact. State President Harry G. Newman pledged the aid of the state field men in obtaining more members, and W. H. Barry offered any assistance the Sanitation Development League could give. Another meeting will be held within two weeks at which time officers will be elected and regular meeting nights will be decided on.

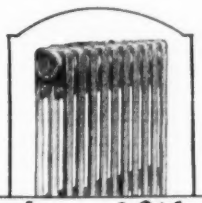
Others attending the meeting were: George A. Shields, San Rafael; W. B. Googin, San Rafael; A. B. Shearer, San Anselmo; W. A. Walsh, San Rafael; M. H. Bretten-

What is wrong with this picture?

It is a peculiar fact that the wider the choice, the harder it is to make a decision. You have perhaps seen this work out (to your own disadvantage) when customers wasted hours of your time and their own in deciding which radiators they would take of the large number comprising the usual line.

The Aero line includes only three patterns and fourteen heights. A choice can be easily and quickly made, which saves you time, money and trouble. Then, of course, there is another advantage. The simplified line permits the jobber to carry an adequate stock, and your orders are filled in a hurry.

Regardless of the type selected, the performance of the radiator will be in every way satisfactory.



The other styles all possess the same attractiveness and grace as this three column type.

Beauty and Warmth

NATIONAL RADIATOR COMPANY
JOHNSTOWN, PA.

PLANTS: Johnstown, Pa., New Castle, Pa., Trenton, N. J.

BRANCH OFFICES: New York, Philadelphia, Baltimore, Washington, Richmond, Pittsburgh, Cincinnati and Cleveland.

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SCIENTIFIC COMBUSTION
BOILERS

are a fine expression of the best that is known in the realm of home heating. Send for wall chart describing and illustrating scientific combustion, corrugated heating surfaces, "back-and-forth" fire travel and other famous Weil-McLain features. A valuable selling help—*free.*

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BOILER SE-MENT-OL

Repairs
Cleans
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Cast Iron or Steam Heating Boilers

YOUR JOBBER HAS IT

The Northwestern Chemical Co.
MARIETTA, OHIO

DURO

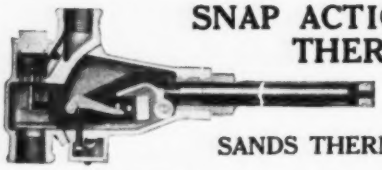
The Full Line of
Water Systems, Pumps, Softeners and Filters

"Line up with DURO the Live One"

Write for catalog, prices and discounts

The DURO PUMP & MFG. CO., Dayton, Ohio

SNAP ACTION THERMOSTAT



SANDS THERMAG VALVE

Absolutely positive—no springs to get out of order. Endorsed by leading engineers.

Sands Thermag Valve is used exclusively on Sands Storage Systems.

Write for descriptive folder

THE SANDS MFG. CO. Cleveland, Ohio

court, Sausalito; H. J. Price, Fairfax; Frank J. Hoirup and P. A. Van Bibber, Petaluma, and E. Puharick, Sausalito.

THREE HUNDRED STUDY OIL BURNERS IN DETROIT

When three hundred master plumbers and heating contractors gather together to learn about oil burners, one must conclude that they are interested in this subject, and this occurred in the city of Detroit on Thursday evening, November 13. The hosts were the Nelson Company, jobbers of plumbing and heating supplies. A talk was given by Mr. Nelson, and an address was also given by W. T. Dean, of Milwaukee, an expert in the combustion of oil. Mr. Dean explained why the master plumber and heating contractor should sell oil burners, and discussed and explained various types of oil burning devices. G. H. Schildmiller, of the American Radiator Company, Detroit, mentioned several contractors in Michigan who have been very successful in the oil burner business.

FAIRFIELD COUNTY MASTER PLUMBERS ENJOY INSTRUCTIVE MEETING

The regular meeting of the Master Plumbers' Association of Fairfield County, Conn., held at Melba Inn, New Canaan, Conn., on Thursday evening, November 13, was marked with action—innumerable exchanges of business ideas, instructive speaking, and an excellent dinner.

State President Howard F. Bryant, Standardization Committeeman R. T. Rock, W. J. Wade, president of the Bridgeport Local, F. G. Crozier and H. N. Wilson, representatives of the Standard Sanitary Manufacturing Company, Pittsburgh, Pa., were guests and each gave a short talk after the dinner had been served. Stephen Miller, president of the Fairfield County association, presided.

After Mr. Wade had addressed a few words of greeting, and of encouragement to the members on the state membership drive, Mr. Rock delivered an interesting address, in which he urged the Fairfield County craftsmen to give the T. E. B. bookkeeping system at least a six months' trial. "The Bridgeport association men have subscribed to the ten lesson course in a body and are getting a world of good out of it," Mr. Rock stated. Switching to the work of the Standardization Committee, the speaker pointed out the benefits that may be derived from the proposed National Plumbing Code. "It will be of special service to communities that have no code," said Mr. Rock, who in closing his remarks further urged the craft to take full advantage of the range boiler standardization in demanding boilers with the new standard tappings.

President Bryant, in addressing the meeting, emphasized the need of greater activity in the organizing of local associations and outlined briefly the noticeable progress that has been made in state work along these lines. The president made known the fact that the organization of a state woman's auxiliary is on foot.

Mr. Crozier's remarks explained the need of co-operative organization to the end of good business and he emphasized the desire of his company to promote a better understanding and closer ties with the plumbing contractor. "This is vital," said Mr. Crozier, "because our concern is dependent on the contractor for the ultimate sale of its products." Mr. Wilson followed with an interesting talk about showers.

The meeting closed with a discussion of the T. E. B. system, at the conclusion of which it was agreed that George A. Powers, of Stamford, Conn., would be the instructor of the bookkeeping class at the next meeting.

Swimming-Pool News

The local post of the American Legion at Forsyth, Mont., has raised $1,300 for a public swimming pool to be donated to the town.

A large swimming pool is to be built in Kennywood Park, Pittsburgh, Pa. The size of the pool is to be 180x350 ft.

Two swimming pools, each 40x125 ft., are being constructed in Long Branch, N. J.

I. Ewig, city engineer of San Antonio, Tex., is in charge of the work on a large reinforced concrete swimming pool near Woodlawn Lake.

A municipal park is to be constructed, including a swimming pool, in Knoxville, Tenn.

The Furman B. Moodie Properties, Inc., Tampa, Fla., have acquired a tract of land on the south side of the Gandy Bridge, and will develop a residential suburb at a cost of about $12,000,000. The new suburb will have a deep water swimming pool.

Two Rivers, Wis., will soon celebrate the formal opening of its new swimming pool in the Washington High School.

Jasper, Ind., is constructing a swimming pool at the old "College Pond," which has heretofore served the town. The new pool will be modern in every respect.

A swimming pool and bath house are proposed for St. Joseph, Mo., the cost of the former being $40,000.

A swimming pool is to be constructed for negroes at Joplin, Mo., the pool being a gift to the city from the late Paul A. Ewart.

A swimming pool costing $40,000 will be constructed in Elwood, Ind., the cost to be defrayed from the earnings of the municipal light plant.

A country club is proposed at Spoade and Ladue roads, St. Louis, Mo., the show feature of which will be a swimming pool.

The San Diego Athletic Club, San Diego, Calif., is having plans prepared for a club house, which will include a swimming pool.

The Casa Del Mar Club has let the contract for erection of a club house in Santa Monica, Calif., at the foot of Pico Blvd. The contract also calls for a swimming pool.

The Glacier-to-Gulf Motorway Association, Boerne, Tex., of which D. E. Colp is manager, is interested in a state park to be established there, which is to include a swimming pool.

Office of the Efficiency Engineering Co., Inc., 89 Warren street, Boston, Mass.

Rutland
Pipe Joint Cement

Try it and you'll never use anything else

THE "show me" method will convince you—just as it has hundreds of others—that Rutland is the best pipe cement that you can buy. It forms a perfect joint that will last indefinitely. If properly applied, it gives a leak-proof and rust-proof joint. And unlike red or white lead, it never becomes so hard that the pipe cannot be disjointed with ease.

Is much better than lead

RUTLAND does a better all around job than lead—every day and in every way. Does not require mixing or fussing—comes ready to apply. It is non-poisonous and is easy to remove from the hands. Rutland may be used on almost any job where threaded pipe is used, and it works successfully on water, hot water, steam (high and low pressure) or gas pipe.

Mail coupon for free trial sample

MAIL the coupon now—today. Prove to yourself that Rutland will do everything that we claim for it. When once you have tried it—you'll never use any other kind of cement. And remember, too, that although Rutland costs slightly more than lead per pound, the bulk is much greater. Thus it costs less than lead in the end.

Other Rutland Products

Plastic Stove Lining — **Pipe Joint Cement**
Asbestos Boiler Covering — **Waste Pipe Cleaner**
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RUTLAND FIRE CLAY COMPANY
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USEFUL PRODUCTS

USE THIS COUPON FOR FREE SAMPLE

RUTLAND FIRE CLAY CO., 1617C, Rutland, Vt.

Send free sample of Rutland Pipe Joint Cement and "Unvarnished Facts" about your other products.

Name.....

Firm.....

Address.....

City.....

Bath a Day Movement

109

A letter from Wm. G. Bergner, past president of the Illinois Master Plumbers Association, advises that three more Illinois cities have placed the "Story of the Bath" in their public schools. These three cities were Carthage, East Moline and West Frankfort. We call this particularly to the attention of the Presidents of Associations.

ON the Editor's desk, as this is being written, lie two letters, one a modest postal card from a small community school which has only fifty-six pupils, and one from the librarian of a metropolitan school system.

This is the inquiry which comes to mind: Why do not these people go to the association which contains members in the two communities?

Here is a lively interest in a live movement. When people ask for something they have heard about, without being pressed to, it's a sign that there is a field ripe for the educational effort embodied in "The Story of the Bath."

It also represents a splendid opportunity for the association (or the jobber) and the individual plumbing and heating contractor to co-operate for the good of the community and for their own good.

If you haven't read "The Story of the Bath," send for a copy. If you have, you know what a force it can be for educating your community in the fundamentals of healthful bathing, which must react in your favor.

We have a feeling that there are many communities like these two—ready and waiting to be interested in educational literature that will raise the standard of living. All that is necessary is leadership—which in this matter ought to be supplied by the plumber.

Wouldn't it be possible for you to call the Bath a Day movement to the attention of the teachers in your community—they are so often leaders for better conditions—and to place the "Story of the Bath" in your school system? Plumbers everywhere ought to ally themselves with the need for higher living standards as indicated by better sanitary conditions.

Central Heating

Chisholm, Minn., is to have a central heating plant which will be built in the basement of the city hall, and which will heat the library, the city hall and the community building.

A $350,000 oil-burning central heating plant is proposed to heat seven municipal buildings in Detroit, Mich. The plant is to be underground in Clinton Park and is to have an ornamental stack 125 ft. tall to carry fumes and smoke above the skyline.

A central heating plant has been placed in operation at Winnipeg, Manitoba, Canada. This plant is of 15,000 horsepower and uses coal for fuel. Several hundred consumers have already signed up for heat from the plant which only went into operation on October 1. The cost was $1,000,000.

The city of Vancouver, B. C., Canada, is planning a central heating system.

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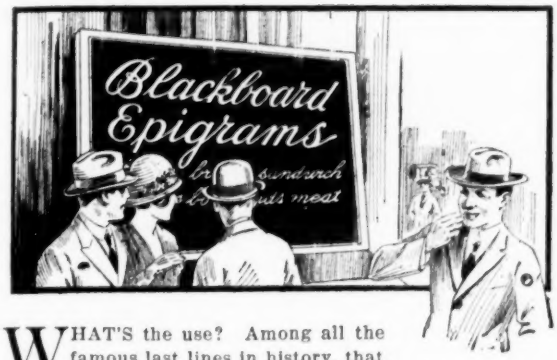
TOILET SEATS

GUARANTEED NOT TO SPLIT

Be up to date
Buy the Adamant—get the
best on the market
It cannot split

Send for Circular

FIBRE MFG. CO.
Boston, (29) Mass.



WHAT'S the use? Among all the famous last lines in history, that should rank first. It's a summing up of the inertia that stands so often in the way of real progress.

What's the use of having a blackboard outside your shop, upon which each day you copy one of these Epigrams?

Have you ever seen it done by anyone in your city? That's the first reason for doing it. It will certainly be unusual.

Watch anything that is outside the routine run of things, and you'll see a little knot of people gathered around it, chuckling about it. A florist in Boston every Spring builds a window display in which he has twenty or thirty little ducklings. They don't have any connection with the flower business, but it is frequently necessary for a policeman to make the crowd move on. The display is unusual and it attracts attention.

A blackboard and a piece of chalk can be made to attract a lot of attention, wisely used. Try it out. It's only one step from the blackboard to your window display—and one more from your window display into your shop.

Some words on the end of your tongue should be allowed to remain there.

* * *

An ounce contributed to the happiness of others is a pound contributed to your own.

* * *

This is a health shop. If you don't believe it, have all the plumbing in your home torn out.

* * *

Drinking to a man's health may be a friendly practice—but it's dangerous these days.

* * *

A bargain is an agreement between two people—one of whom is laughing up his sleeve.

* * *

Although a man may feel his oats, it's no sign he has horse sense.

* * *

High life has brought many a man low.

COAST COUNTIES MASTER PLUMBERS' ASSOCIATION FAVORS PORTLAND

The Coast Counties Master Plumbers' Association, in session at Salinas, Calif., voted unanimously in favor of holding the 1925 California State Convention at Portland, Ore., next June. President E. C. Simpson told of the plan to meet a day prior to the national convention and then attend the latter meeting in a body.

J. C. Greenberg, substituting for Col. W. G. Archer of the National Trade Extension Bureau, was the speaker of the day. His topic was: "Brain Power in Relation to Business." V. A. Edgeworth, business manager of the Oakland, Alameda and Berkeley Association, and C. C. Newkirk, field man of the California State Asso-

Haas

Flush Valves for use in combination with all styles of bowls for all classes of service to operate under low or high pressure water supply.

Water Closets for every type or class of service.

Frost Proof Closets. Direct flush or after flushing.

Write for catalog.

Philip Haas Co., Dayton, O.

SQUARE "GEE" FITTINGS
Iron & Malleable Iron

We are so proud of Square "Gee" fittings that we stamp on each one a square G as a means of instant recognition.

THE GRABLER MANUFACTURING CO.
CLEVELAND, O.

UNCONDITIONALLY GUARANTEED
ARROW
TRADE MARK

STEEL TANKS

PNEUMATIC—STORAGE—SPECIAL
Black or Galvanized
The Novelty Steam Boiler Works Company
Factory, 917-929 S. Howard St. BALTIMORE, MD.

The most advertised showers in the world are

SPEAKMAN SHOWERS

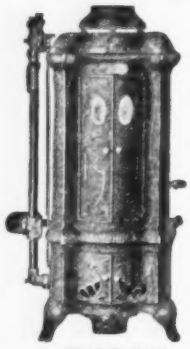
SPEAKMAN COMPANY
WILMINGTON, DELAWARE

UNITED
BRASS GOODS

In United products, quality is no mere selling word. It's what we put into them to assure permanent unfailing service.

UNITED BRASS MFG. COMPANY
3844 Hamilton Avenue Cleveland, Ohio

An Old Beauty Secret



American women spend millions and millions for beauty creams powders and such. But the greatest beauty preparation of all time can be made from this simple home formula: *H-2-O plus Heat* And that's nothing but just plain, old-fashioned

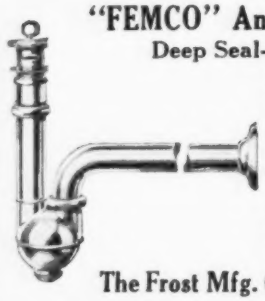
Good Hot Water

Home owners in your town need Humphrey Automatic Gas Water Heaters. There's a good profit on each sale—and installation charges besides. Let us help you sell them—write today.

TYPE "A"

HUMPHREY COMPANY
Kalamazoo, Michigan
(Div. Ruud Mfg. Co.)

"FEMCO" Anti-SyphonTraps
Deep Seal-Centrifugal



Beautiful in design, having a highly polished, non-tarnishing nickel plated finish. Body made of 17 gauge drawn brass.
1¼" has a 3⅜" seal
1½" has a 4¼" seal
Made in "P" and "S" patterns. Inlet and outlet tubes 17 or 20 gauge.

The Frost Mfg. Co., Kenosha, Wis.

GREASE AND GRIEF

Grease is all right in its proper place, but when it gets mixed with water and into the drain pipes and sewers, there's no end of trouble.

An Estabrook Grease Trap

will do away with all the annoyance and expense coincident with greasy water. Intended for outside installation. Amount of brick work depends on depth of trap.

Send for catalog

R. ESTABROOK'S SONS
1st and C Streets
SOUTH BOSTON, MASS.

ciation, told of the benefits of the new mutual insurance association of the state body.

Obituary

Louis D. Wright

Louis D. Wright, sales representative for the H. B. Smith Co., Westfield, Mass., died recently at his home in Springfield, Mass.

J. W. Cockburn

J. W. Cockburn, engineer of the central heating plant in Winnipeg, Manitoba, Canada, and for many years connected with the central heating movement in western Canada, died recently at his home in that city.

B. N. Coffman

B. N. Coffman, secretary of the California Sanitation Development League of San Francisco, Calif., died suddenly at his home in Oakland, Calif., on Friday evening, November 14, of heart trouble. Mr. Coffman had been engaged in organization work all his life, having been secretary of the Metal Trades Association of Los Angeles and of the Paper Trades Association, as well as of the Sanitation Development League.

Convention Dates

December 9, 10, 11, 1924.—The winter meeting of the National Association of Brass Manufacturers, at the Hotel Astor, in New York City.

January 6, 7 and 8, 1925.—Joint convention of the South Dakota Retail Plumbers' Association and the General Contractors of South Dakota, at Mitchell, S. Dak.

January 20, 21 and 22, 1925.—The annual convention of the Illinois Master Plumbers' Association, in the Elks' Building at Springfield, Ill.

January 27, 28 and 29, 1925.—The annual convention of the Iowa Master Plumbers' Association, at Dubuque, Iowa.

January 28, 29 and 30, 1925—The annual meeting of the American Society of Heating and Ventilating Engineers, at the Copley-Plaza Hotel, Boston, Mass.

February 3 and 4, 1925.—The annual convention of the Minnesota Retail Plumbers' Association, at Minneapolis, Minn.

February 11, 1925.—The Winter meeting of the Eastern Supply Association, at the Hotel Astor, New York City.

February 16, 17 and 18, 1925.—The 37th annual convention of the Kansas Master Plumbers' Association, Emporia, Kans.

February 24, 25 and 26, 1925.—The annual convention of the Ohio Master Plumbers' Association, at Deshler hotel, Columbus, Ohio.

March 9, 10, and 11, 1925.—The annual convention of the Indiana Society of Sanitary Engineers at West Baden Springs Hotel, West Baden, Ind.

April 2 and 3, 1925.—The annual convention of the Arkansas State Master Plumbers' Association, at Pine Bluff, Ark.

April 7 and 8, 1925.—The annual convention of Massachusetts State Master Plumbers' Association, at Boston, Mass.

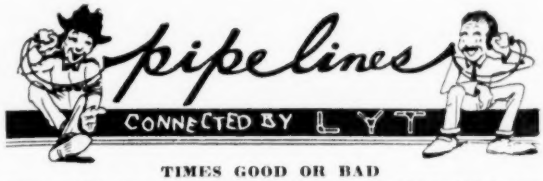
April 28 and 29, 1925.—The annual convention of the Colorado Society of Sanitary & Heating Engineers, at Denver, Colo.

May 11, 12 and 13, 1925.—The annual convention of the Kentucky Association of Master Plumbers, at the Crab Orchard Springs Hotel, Crab Orchard Springs, Ky.

May 12 and 13, 1925.—The annual convention of the Pennsylvania State Association of Master Plumbers at Wilkes-Barre, Pa.

June 21 and 22, 1925.—The annual convention of the Master Plumbers' Association of the State of Washington, at Portland, Ore.

June 23, 24 and 25, 1925.—The 43rd annual convention of the National Association of Master Plumbers, at Portland, Ore. The sessions will be held in the Portland Auditorium.



TIMES GOOD OR BAD

This is the age of prosperity. Queen Elizabeth didn't even have a bathtub. Any modern $25 a week stenographer has more luxuries than Queen Elizabeth had.

You are away off, Bill. Maybe Queen Elizabeth didn't have a bathtub, but she had three hundred dresses, while the poor modern flapper has to go nearly naked.

HALVORSEN, N. D.

John, what makes the steam pipe rattle and bang that way?

That's one of those "hell-Maria" pipes you have heard about getting into action.

(And this one came from Boston.)

BATHING FOR APPEARANCES

Bobby, did you wash your face before the music teacher came?

Yes'm.

And your hands?

Yes'm.

And your ears?

Well ma, I washed the one that would be next to her.

THROUGH THE GLASS

Two Englishmen, rather the worse for wear, were returning homeward in the starlight. They paused before the display window of a progressive plumbing shop.

"I say, Bertie," remarked Lord Highball, "wouldn't it be deucedly embarrassing to have one's bawth in such a conspicuous place?" E. V. W., Reading, Pa.

Most of the cross-word puzzle fans are unmarried. Cross words are no puzzle to the benedict.

I KISSED HER—No. 10

I kissed her, that is, tried to,
But she swiftly changed her pose;
And though I aimed to kiss her lips,
It landed on her nose.

A. T. L., Los Angeles, Calif.

PIPE LINES DICTIONARY

TOWEL
—a fabric substituted by small boys for soap and water.

WEEK
—the seven-day drought between two paydays.

YEAR
—a period of time usually associated with the word "next" by men whose wishbone is where their backbone ought to be. K. Y. W., Chicago.

A LINCOLN STORY

A new story concerning President Lincoln has to do with a politician who thought he ought to be rewarded for his services to the party. Lincoln said, "Sit down, and I'll tell you a story. Once there was a king who wanted to go hunting. His magician told him the weather would be fair. On the way to the hunting grounds the party met a peasant who expressed surprise that the king should be going hunting when bad weather threatened. When the king asked how he knew, he said, 'Why my jackass there always gets stubborn before bad weather.'

"But the king believed his magician and went on. In a few hours a storm overtook them. The king turned back, and on the way home bought the jackass, which from that time forward was to be the kingdom's weather prophet.

"And do you know," Lincoln wound up, "since that time every jackass in the world has wanted to hold public office."

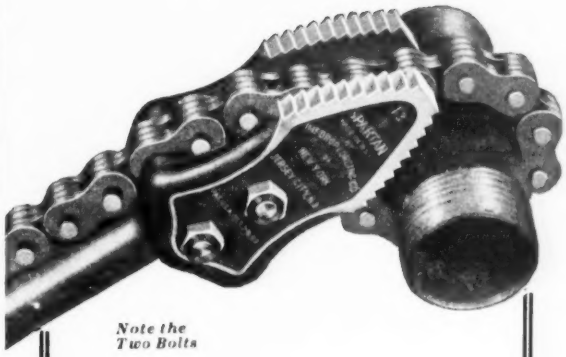
L. N. M., Toledo, Ohio.

EASY PHILOSOPHY

A relative of mine owns a house down East. There is a hole in the roof and when asked why he doesn't fix it, he says, "Wall, when it's rainin', I cain't, an' when it ain't I don't need to." L. W. B., Charleston, W. Va.

Recently a man who had inherited a million dollars gave it all away. I admire his courage, but my admiration is tinged with a suspicion that his real reason for doing it was to sidestep the task of figuring out his income tax.

L Y T.



Note the Two Bolts

SPARTAN
CHAIN TONGS

Two outstanding features make the Spartan by far the most desirable chain pipe wrench.

First

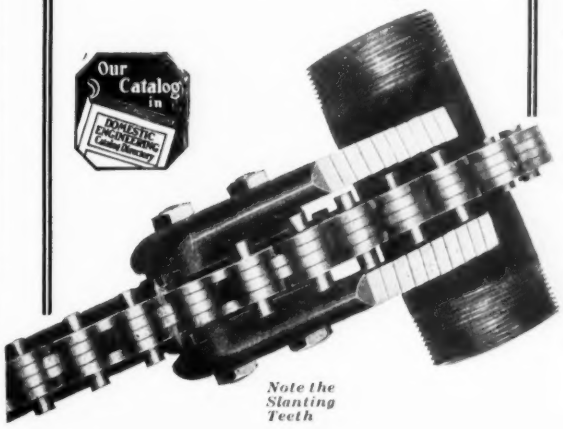
There are two bolts—if the upper bolt should break, the lower one is there to take its place.

Second

The teeth are slanted instead of straight cut and will not slip even when dull.

The Spartan Wrench costs no more than others. Order them through your jobber.

Drop Forging Co.
of New York
Jersey City, New Jersey

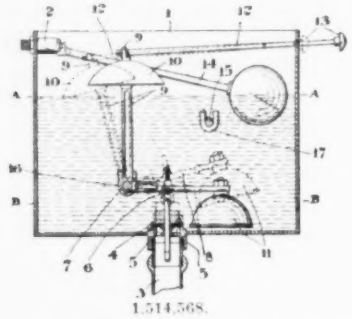


Note the Slanting Teeth

PATENTS

Plumbing Department

1,514,568. Flushing Cistern. Charles Ernest Page, Jack Findlay Page, and Charles Norman Page, Christchurch, New Zealand. A flushing cistern comprising a containing vessel, means for admitting water thereto, a valve governing the discharge of water from the said vessel, a bell crank lever fulcrumed in said vessel to be turnable in a vertical plane with one arm of the bell crank extending vertically and the other arm of the bell

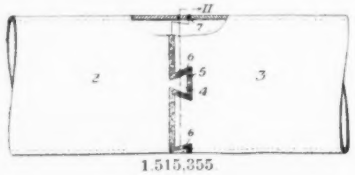


1,514,568.

crank extending in a substantially horizontal plane, means operatively connecting the horizontal arm of the lever with the aforesaid discharge valve, a weight carried by the vertical arm of the lever to maintain said lever in valve-opening position when moved thereto, a body carried by the horizontal arm of the lever arranged when submerged to ineffectively oppose said control of the lever by said weight, but on becoming emerged to overcome said control and turn said lever to its valve closing position, and means for moving the lever to valve opening position comprising a rod mounted to slide through an opening in the containing vessel and equipped with handle means at its outer end, stop means carried by an intermediate portion of the rod for engaging the inner wall of the containing vessel, and a pivotal connection between the inner end of the rod and the weighted arm of the lever.

* * *

1,515,355. Welded Pipe-Line Joint and Method of Making the Same. Harbour Mitchell, Pittsburgh, Pa., assignor to American Foundry & Construction Company, Pittsburgh, Pa. The method of forming a welded pipe joint, which consists in providing the adjacent end portions of two pipe sections to be welded with interfitting tongues or projections and grooves adapted to form a mechanical interlocking between the said sections for preventing longitudinal separation of the same due to



1,515,355.

internal pressure, engaging the tongues or projections of one section with the grooves of the other section by relatively moving the tongues or projections and grooves in a direction at an angle to the longitudinal axis of the sections, and then forming a welded connection between the abutted and interfitted ends of the sections substantially as described.

BRECO CLOSET SEATS
HAVE
BEST
MATERIALS

NEW ENGLAND OAK AND BIRCH
CAREFULLY SELECTED AND KILN DRIED
CAST BRASS HINGES WITH BRASS NUTS
HIGH GRADE WATER PROOF VARNISH

BRECO
CLOSET SEATS AND FLUSH TANKS

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CLOSET SEATS

QUALITY AND SERVICE AT A
REASONABLE PRICE

BRE MFG. COMPANY
HYDE PARK DISTRICT
BOSTON, MASSACHUSETTS

OUR CATALOG IN DOMESTIC ENGINEERING
CATALOG DIRECTORY

RUSSELL
Perfect Air Valve

Has been in constant
demand for over
30 years.

List Price, $1.50 each.

Made by the man who invented
the volatile liquid air valve.

RUSSELL
Perfect Air Valve

For Coils and Mains.
¼" Bottom Outlet
List Price, $2.50 each.

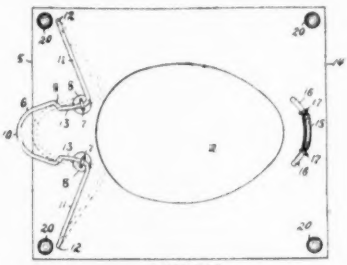
These valves can also be furnished with vacuum
attachment.

Ask Your Jobber

W. A. RUSSELL & COMPANY
Founded 1890
Grand Central Terminal Bldg. New York City

BRANCHES:
The Straus Bldg. Chicago, Ill.
The Chemical Bldg. St. Louis, Mo.
46 Cornhill Boston, Mass.

1,515,583. Toilet-Seat Attachment. George H. Van Arnam, Fort Wayne, Ind., assignor to Van Arnam Manufacturing Company. A child's seat attachment for a regular toilet seat, comprising an apertured supplemental seat applicable to be superimposed upon the regular seat, a spring wire frame disposed on the bottom of the supplemental seat at the rear portion thereof, said frame having a central pendant loop with a rearwardly extending lower extremity, and having lateral swinging arms, each of which has an upturned end extending into said supple-

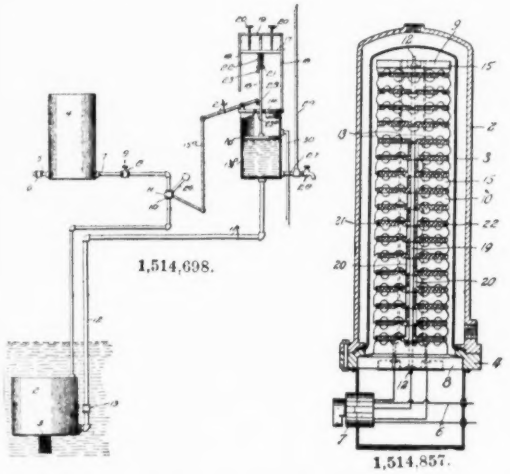


1,515,583.

mental seat and upon which the arm turns pivotally, said frame also having curved sides between the corresponding arms and the pendant loop, the radius of each side being centered at the instance of the upturned end of the corresponding arm; a chafing plate interposed between each of said curved sides of the frame and the supplemental seat; a staple loosely securing each of said curved sides to the seat and extending through the corresponding plate; and a pendant stop projecting from the bottom of the supplemental seat adjacent the front end thereof.

* * *

1,514,698. Water System. James G. Hampton, Lafontaine, Kans. A water supply system comprising, a compressed air receptacle, a water collecting vessel arranged in a source of supply and receiving water therefrom, a conduit between said receptacle and vessel and providing means whereby water will be forced from the vessel on the supply of compressed air from said receptacle, a controlling valve for said conduit, a vertical tank independent of said conduit and receptable and provided with a



1,514,698.

1,514,857.

piston operated upwardly on a supply of water to said tank, a spring controlled piston rod for operating the piston in the opposite direction, said rod extended from the tank and provided with a pair of spaced trips, a trip mechanism pivotally supported upon the tank and having one end arranged in the path of said trips and its other end connected to said valve and operated to close the valve on the upward movement of the piston.

"Mon-Seal"

CHICAGO POTTERY CO.

Specializes

in the manufacture of

Closet Bowls and Tanks

of "Whitest Vitrified China"

1924-40 CLYBOURN AVENUE

CHICAGO

The Hotstream WATER HEATER

KEROSENE HEATER

WICK BURNER TYPE

An economical, safe, convenient Hotstream Heater that furnishes constant hot water for domestic use, day and night. Noiseless, smokeless, odorless, no generating. Burns 19 to 30 hours per gallon. Wick requires no trimming. Sells and satisfies because it's right.

LET'S GO!

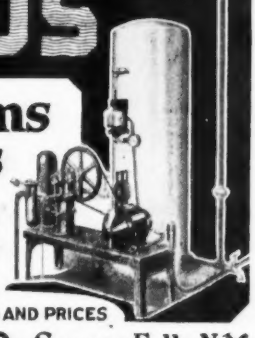
Have you our Catalog and Price Sheet covering our complete line of popular priced heaters? Write today.

THE HOTSTREAM HEATER COMPANY, Cleveland, Ohio

"Makers of Heaters That Heat"

GOULDS

Water Systems ARE Big Sellers



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BRANCHES IN ALL PRINCIPAL CITIES

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Bull Dog Seats

Bull-Dog celluloid covered seats have all the good qualities of Bull-Dog varnish finished seats.

THE HEAP CO.

No Roof Is Superior to Its Flange—

Therefore, some PLUMBER is the father of every leaky roof.

THE BULLARD ROOF FLANGE

is acknowledged as the only PERFECT FLANGE by busy men who have made satisfying installations.

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MYERS

SELF-OILING BULLDOZER POWER PUMPS

Operation of any plant, mill, mine or factory, without taking water into consideration is impossible. Its consumption for manufacturing processes, sanitary and other purposes varies according to the size of the plant and its daily output. Myers Self-Oiling Power Pumps and Working Heads are demonstrating in hundreds of installations that they are not only absolutely dependable but by their new standard of service are reducing water costs to a minimum. Made in styles and sizes for a wide range of service. Little doubt but that there is a MYERS SELF-OILING POWER PUMP that will satisfactorily meet your individual requirements. Catalog on request.

Dealers, ask for information and price.

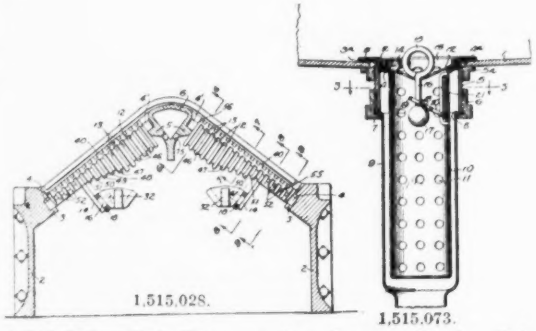
THE F. E. MYERS & BRO. CO. Ashland, Ohio.

ASHLAND PUMP AND HAY TOOL WORKS

1,514,857. Fire Bar for Electric Water Heaters. Robert H. MacInnes, Hamilton, Ontario, Canada, assignor to D. Moore Company, Limited, Hamilton, Canada. A support of refractory insulation material for the resistance of an electric fire bar comprising a disc, a flange formed on the periphery of the disc parallel with a plane at right angles to its axis, the flange being terminated to provide a short intervening space between its ends, and a lug formed on the disc longitudinally of its axis in said space equidistant of the ends of said flange, said disc being adapted to have resistance wire laid against a surface of said flange transverse of the axis of the disc and turned around one end of the flange in one direction adjacent said lug and away from the opposite end of the flange in the opposite direction.

* * *

1,515,028. Grate Apparatus for Water Heaters. Merriman C. Gillett, Philadelphia, Pa., assignor to Standard Heater Company, Williamsport, Pa. In a grate apparatus the combination of a plurality of interchangeable perforated grate bars each provided with a trunnion at each end; perforations between said trunnions and depending symmetrically disposed flanges of successively different lengths disposed on each side of said trunnions; said flanges of succeeding bars when tilted in the same direction adapted to form openings of different dimensions with the tops of preceding bars; and reciprocating means adapted to tilt said bars to form said openings.



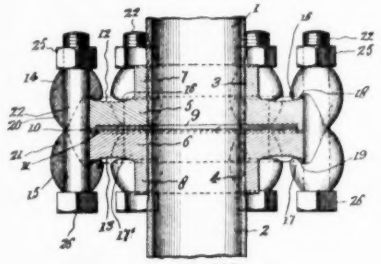
1,515,028. 1,515,073.

1,515,073. Sink Trap. Arthur Savard, Omaha, Nebr. A trap for sinks having a flanged drain plate therein, which comprises a perforated trap cylinder loosely supported on the flanges of the drain plate, a perforated drain plug engageable in the opening of the drain plate to clamp the upper ends of the trap against the flanges of the drain plate and flexible connections between the trap and the plug.

Heating Department

1,514,803. Flange Pipe Coupling. Dracos Souter and William Z. Wilkinson, Baton Rouge, La. A detachable pipe coupling comprising a pair of flanges attached to adjacent ends of two sections of pipe to be joined together, a gasket placed and compressed between the adjacent faces of said flanges, the remote faces of the flanges being curved radially, and a number of clamps placed at intervals about the circumferential edges of said flanges, each of said clamps comprising two substantially spherical members having rounded noses adapted to come into contact with the curved remote faces of said flanges, said clamp members having registering openings therethrough, a bolt made separate from said two clamp members and freely fitted through the registering openings therein for drawing the clamp members together upon said flanges and for causing the rounded noses to ride radially inward upon the curved remote faces of said flanges, said clamp

members having clearance spaces extending inwardly of the noses and further provided with extensions opposite the noses and being considerably longer than said noses, said extensions of the two clamp members approaching close to one another at the outer sides of the bolt and extending laterally of the bolt, the opening through said clamp members adapted to snugly fit the bolt.



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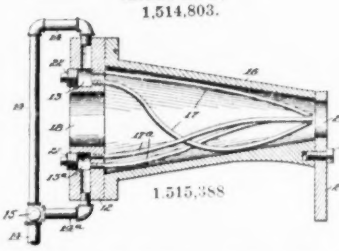


1,515,388

1,515,430

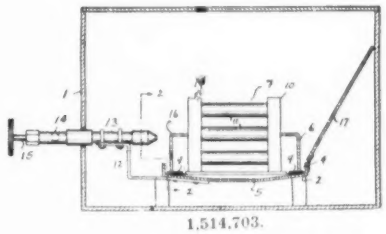
1,515,388. Oil Burner. Charles R. Hopkins, Alliance, Ohio. An oil burner comprising a chambered burner head and nozzle, combined with an adjustable regulating disk mounted on the discharge end of said nozzle and having a plurality of openings of different sizes any one of which may be brought into register with said discharge end of said nozzle, said head having two oil inlet chambers, pairs of oil tubes in said nozzle, said tubes communicating with said oil inlet chambers and having converging discharge ends closely adjacent to the outer end of said nozzle, and oil feed pipes communicating with said oil inlet chambers.

* * *

1,515,430. Reamer. Charles E. Browne, Oakland, Calif. A reamer comprising a body, a radially adjustable guide member mounted on said body and inclined to the longitudinal axis thereof, and a straight blade arranged on said body adjustable independently of said guide.

* * *

1,514,703. Oil Burner. Henry F. Hyman, Conroe, Tex. In an oil burner, the combination with a target formed of open tubes and spaced anchors to which the ends of the tubes are attached, of an oil projecting nozzle arranged



1,514,703.

to project oil against said target, a supporting pan, an inverted box-like apron having its side facing the nozzle perforated, and its upper side having a cut away portion, said target being supported in the pan, and projecting up through the cut away portion, of the apron.

* * *

1,514,455. Pipe Hanger. John Gordon, Minneapolis, Minn. A pipe hanger comprising a barrel reversely threaded interiorly at its opposite end portions, a suspend-

Its Instant Grip
is Unbreakable
This superior drop-forged pipe vise is easily attached to post or bench, adjustment quickly made, and pipe instantly locked in an unbreakable grip with just a turn of the handle.
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PLUMBING AND HEATING GOODS jobber in Chicago needs competent order producers for city trade. If you can fill the bill address Key 203, "Domestic Engineering," 1900 Prairie Ave., Chicago.

WANTED: MANUFACTURER'S AGENT to represent us with a line of pipe nipples to the jobbers only. Address Key 204, "Domestic Engineering," 1900 Prairie Ave., Chicago.

WANTED: EXPERIENCED SALESman to handle "Rex" Boiler Treatment, Water Softener and Drain Pipe Solvent. Commission basis. State age, experience, territory covered. Address Universal Chemical Company, Lincoln, Neb.

WANTED: RADIATOR AND BOILER salesmen. Please give your sales experience during the past six years. Confidential. Union Radiator Co., Johnstown, Pa.

WANTED: OFFICE MAN FAMILIAR with plumbing and heating trade who can estimate and take charge of office. Howard Mesnard, 401 Penobscot Bldg., Detroit, Mich.

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SALESMAN WANTED — PROMINENT manufacturer of pumps and water systems requires salesman for Illinois territory. The man we are seeking is experienced in this line or in plumbing supply line, thoroughly acquainted with the plumbing, electrical and hardware trade in Illinois. He must have a car and furnish a satisfactory record. All replies will be confidential. Address Key 165, "Domestic Engineering," 1900 Prairie Ave., Chicago.

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HIGHEST CASH PRICES PAID
WRITE US
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If you are looking for competent employes; or if you contemplate a change in position, have a patent for sale; wish to purchase or sell a plumbing and heating business; second-hand machinery or tools; form a co-partnership, etc., your advertisement on this page will put you in touch with the people you desire to reach.

The cost of insertion is only eight cents a word and may mean many dollars to you.

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PRACTICAL STEAM AND HOT WATER HEATING AND VENTILATING. By Alfred G. King. This book should be in every steamfitter's library. A strictly up-to-date work, describing various systems of heating and ventilation. Besides the technical features, it contains hints on securing contracts, business methods, shop practice, rules and data for estimating radiation and figuring costs, and other tables and suggestions that are time savers. Size 6x9 in. 368 pages, 300 detailed illustrations. Cloth. Price, $3.50.

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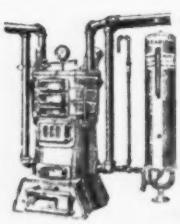

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ing rod engaged in one end of the barrel, a flange on said rod at the free end thereof to bear against a fixed support, a securing device projecting from said flange, a hanger rod engaged in the opposite end of the barrel, a head on the outer end of the hanger rod, and a pipe-encircling band detachably secured across and against said head, rotation of the barrel effecting simultaneous endwise adjustment of the rods.

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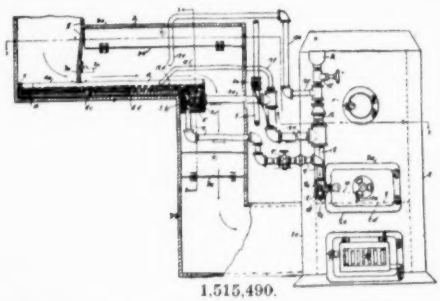
1,515,490. Apparatus for Humidification of Air. Harry W. Jordan, Syracuse, N. Y. Means for humidifying air, including a water heating element adapted to be disposed in the fire-pot of a furnace, an evaporating pan adapted to



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be disposed in the fresh air duct of the furnace adapted to receive the products of the heating element and to give off hot moisture to the air as it passes over the pan, and means for regulating the depth of the volume of air passing over the pan.

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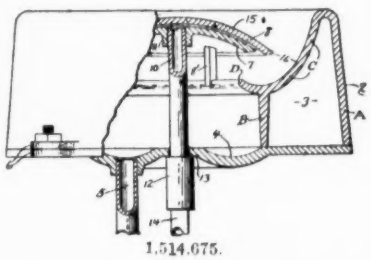
1,514,675. Oil Burner. Joseph Schermuly, Wichita, Kans. In an oil burner, a feed pipe having an overflow reservoir mounted thereon, an overflow pipe for said reservoir, an air inlet in the rim of said reservoir, a generating pan and circulating air chamber combined mounted on said reservoir rim, and the air chamber registering with the opening in the said rim, means for fastening the rim of said reservoir to the outside wall of the air circulat-



1,514,675.

ing chamber, a convex member mounted on the supply pipe said member having a plurality of radiating grooves in the convex face thereof, and on one opposite side of said member a plurality of legs adapted to seat on the rim of said generating pan, a hood mounted on the convex member so that the oil will be diitributed uniformly through the radiating grooves, and also to function as a heating element to generate the oil into gas, all for the purpose set forth and described.

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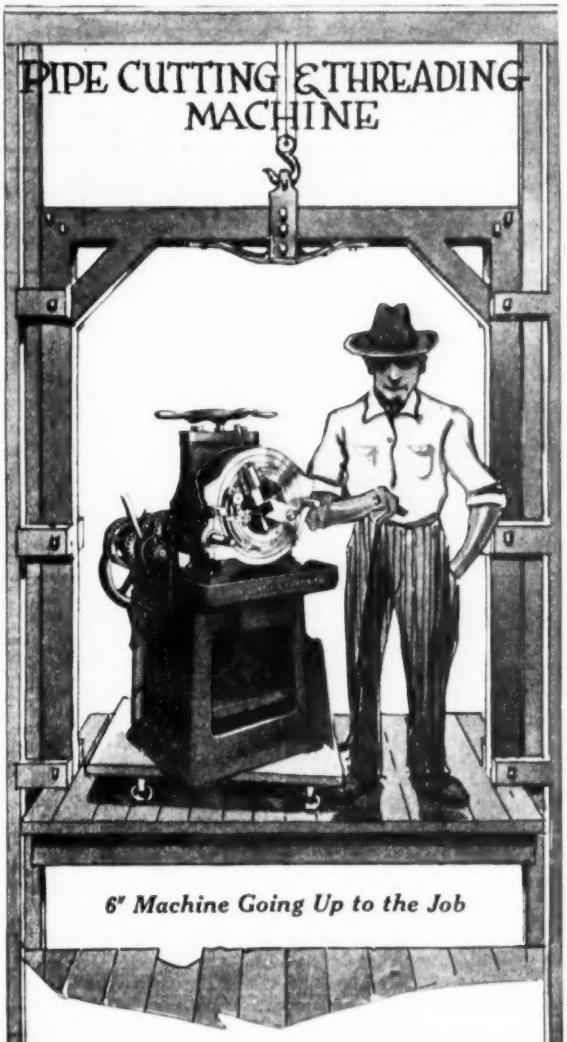

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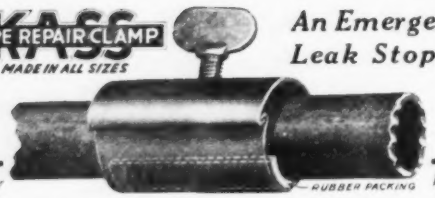
MADE IN ALL SIZES

An Emergency Leak Stopper



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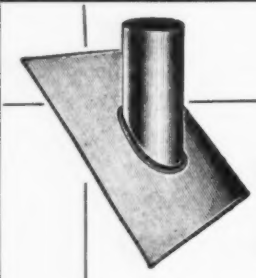

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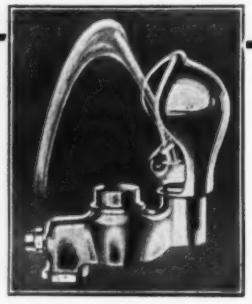

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American Enameled Products Co., Chicago.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Wise Co., Inc., J.B., Watertown, N.Y.

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Kohler Co., Kohler, Wis.
Rundle Mfg. Co., Milwaukee.
Standard San. Mfg. Co., Pittsburgh.
U. S. San. Mfg. Co., Pittsburgh.

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Martin & Sons, H. P., Owensboro, Ky.

BENDERS, PIPE
Martin & Sons, H. P., Owensboro, Ky.
Penn Eng. Co., Reading, Pa.

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Compound Inj. & Specialty Co., Chicago.
Eastern Fdy. Co., Boyertown, Pa.
Frost Mfg. Co., Kenosha, Wis.
Greenwood Mfg. Co., Detroit.
Josam Mfg. Co., The, Cleveland.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Co. of America, Linfield, Pa.

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Maddock's Sons Co., Thos., Trenton, N. J.

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Bryant Heater & Mfg. Co., Cleveland.

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American Radiator Co., New York.
Bryant Heater & Mfg. Co., The, Cleveland, O.
Burnham Boiler Corp., Irvington, N. Y.
Continental Heater Corp., Dunkirk, N. Y.
General Boilers Co., Waukegan, Ill.
Gorton & Lidgerwood Co., New York.
Gurney Heater Mfg. Co., Boston.
Heggie Simplex Boiler Co., Joliet, Ill.
Herbert Boiler Co., Chicago.
Illinois Malleable Iron Co., Chicago.
International Heater Co., Utica, N.Y.
Kewanee Boiler Co., Kewanee, Ill.
Page Boiler Co., Wm. H., New York.
Richardson & Boynton, Co., New York City.
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Smith Co., H. B., Westfield, Mass.
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Gorton & Lidgerwood Co., New York.
Herbert Boiler Co., Chicago.
Pierce, Butler & Pierce Mfg. Corp., New York.
Weil-McLain Co., Chicago.
Wilks Mfg. Co., S. Chicago.

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Chicago Pottery Co., Chicago.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Kalamazoo San. Mfg. Co., Kalamazoo, Mich.
Kohler Co., Kohler, Wis.
Maddock's Sons Co., Thomas, Trenton, N.J.
Standard San. Mfg. Co., Pittsburgh.
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Carty & Moore Eng. Co., Detroit.
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Grinnell Co., Providence, R.I.
Healy-Ruff Co., Minneapolis, Minn.
Smith Co., H. B., Westfield, Mass.
United States Radiator Corporation, Detroit.

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Riverside Foundry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.
Wessels & Sons, D. D., Detroit.

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Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Mueller Co., Decatur, Ill.
United Brass Mfg. Co., Cleveland.

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American Radiator Co., Buffalo.
Capitol Brass Works, Detroit.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Fulton Co., The, Knoxville, Tenn.
Haydenville Co., Haydenville, Mass.
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Kennedy Valve Mfg. Co., Elmira, N. Y.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.

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Central Brass Mfg. Co., Cleveland.
Crane Co., Chicago.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Mueller Co., Decatur, Ill.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Ryan & Co., J. J., Chicago.
Trenton Brass & Machine Co., Trenton, N.J.
Union Brass & Metal Mfg. Co., St. Paul.
United Brass Mfg. Co., Cleveland.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

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Herbert Boiler Co., Chicago.
Illinois Malleable Iron Co., Chicago.
Kewanee Boiler Co., Kewanee, Ill.
Wilks Mfg. Co., S., Chicago.

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Illinois Malleable Iron Co., Chicago.
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Northwestern Chemical Co., Marietta, O.
Rutland Fire Clay Co., Rutland, Vt.
Smooth-On Mfg. Co., Jersey City.

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Porcela-Radax Co., New Brighton, Pa.
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Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
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Estabrook's Sons, R., So. Boston.
Greenwood Mfg. Co., Detroit.
Hilton Brass Foundry, Hilton, N.J.
Phoenix Brass Fdy., Irvington, N.J.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
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Buyers' Directory

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Haydenville Co., Haydenville, Mass.
Illinois Malleable Iron Co., Chicago.
McShane Bell Fdy. Co., Baltimore.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Mueller Co., Decatur, Ill.
Northern Indiana Brass Co., Elkhart, Indiana.
Phoenix Brass Fdy., Irvington, N.J.
Republic Brass Co., Cleveland.
Sherwood Brass Works, Detroit.
Union Brass & Metal Mfg. Co., St. Paul.
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Riverside Boiler Wks., Inc., Cambridge, Mass.

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Crane Co., Chicago.
Illinois Malleable Iron Co., Chicago.
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Greenfield Tap & Die Corp., Greenfield, Mass.
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Toledo Pipe Threading Machine Co., Toledo, O.
Woodward-Wanger Co., Philadelphia.

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Chicago Pump Co., Chicago.
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Eastern Fdy. Co., Boyertown, Pa.
Greenwood Mfg. Co., Detroit.
Josam Mfg. Co., Michigan City, Ind.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
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Josam Mfg. Co., Michigan City, Ind.

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Hilton Brass Foundry, Hilton, N. J.
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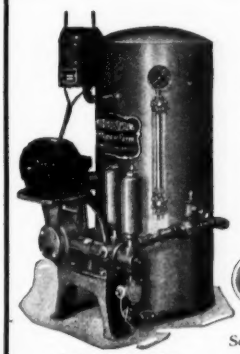

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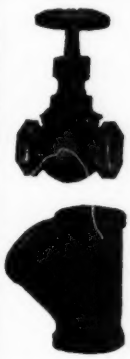

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Reco Septic Tanks
Are best by test, for there is never a comeback.
It is built scientifically and mechanically correct of the best materials obtainable. It is light in weight and quickly and easily installed.
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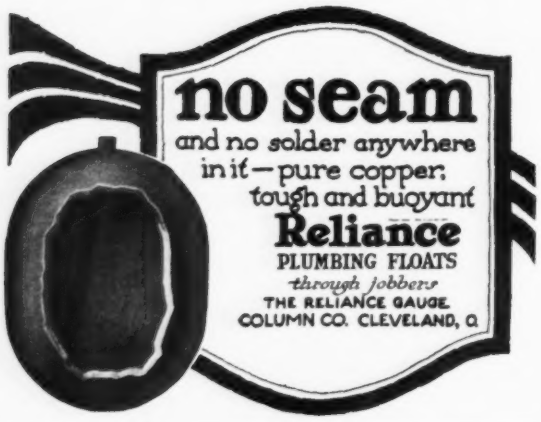

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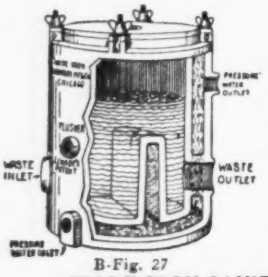

B-Fig. 27

The unusual success of this trap is due to the special design and working principle. Entire body, walls and center partition surrounded by cold water. Grease congeals as soon as it enters trap and floats to top where cleanout cover permits easy removal.

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FRAMES, SINK

Wessels & Sons, D. D., Detroit.

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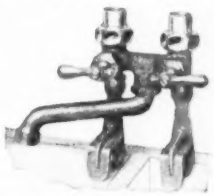

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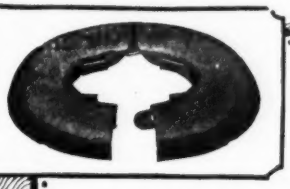

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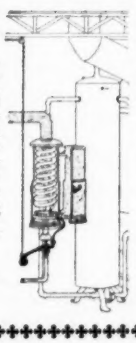

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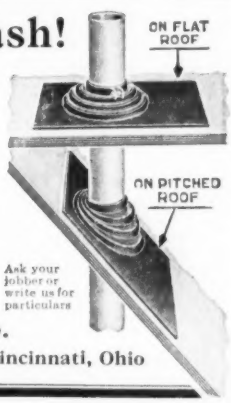

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Riverside Boiler Wks., Cambridge, Mass.
Trageser Steam Copper Wks., John, New York.
Wessels & Sons Co., D. D., Detroit.
Wheeling Steel Corporation, Wheeling, W.Va.
Wood Mfg. Co., John, Conshohocken, Pa.

RANGES, COAL
Richardson & Boynton Co., New York.

REAMERS, PIPE
Armstrong Mfg. Co., Bridgeport, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Mueller Co., Decatur, Ill.

REGULATORS, DAMPER
American District Steam Co., No. Tonawanda, N. Y.
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
C. A. Dunham Co., Chicago, Ill.
Fulton Co., The, Knoxville, Tenn.
Honeywell Heating Specialties Co., Wabash, Indiana.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Nason Mfg. Co., New York.
O-E Specialty Mfg. Co., Milwaukee.
Powers Regulator Co., Chicago.
Sterling Engineering Co., Milwaukee, Wis.

REGULATORS, HOT WATER
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Fulton Co., The, Knoxville, Tenn.
Honeywell Heating Specialties Co., Wabash, Indiana.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Mueller Co., Decatur, Ill.
Powers Regulator Co., Chicago.
United States Radiator Corporation, Detroit.

REGULATORS, TEMPERATURE
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Fulton Co., The, Knoxville, Tenn.
Honeywell Heating Specialties Co., Wabash, Indiana.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Chicago.
United States Radiator Corporation, Detroit.

REGULATORS, TEMPERATURE, AND RADIATOR COVERS
Fulton Co., The, Knoxville, Tenn.

RUBBER GOODS, PLUMBING
Canfield Co., H. O., Bridgeport, Conn.
Lavelle Rubber Co., Chicago.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

SAWS, HACK, HAND AND POWER
Clemson Bros., Inc., Middletown, N. Y.

SAWS, HACK, ROTARY
Excelso Specialty Wks., Buffalo.
Hotstream Heater Co., Cleveland.
Riverside Boiler Wks., Cambridge, Mass.

SEATS, TOILET
Bre Mfg. Co., Hyde Park, Mass.
Built-Well Mfg. Co., Chicago.
Coyne & Delany Co., Brooklyn.
Douglas Co., John, Cincinnati.
Fibre Mfg. Co., Boston.
Heap & Sons, Wm., Grand Haven, Mich.
Knott Mfg. Co., Tell City, Ind.
McLane Mfg. Co., Milford, N. H.
Never Split Seat Co., Evansville, Ind.
Olmstead-Thomson Mfg. Co., New Britain, Conn.
Sherwood Brass Works, Detroit.
Standard Tank & Seat Co., Camden, N. J.
Van Arnam Mfg. Co., Ft. Wayne, Ind.
Woodward-Wanger Co., Philadelphia.

SEATS, TOILET, BABY
Built-Well Mfg. Co., Chicago.
Coyne & Delany Co., Brooklyn.
Van Arnam Mfg. Co., Ft. Wayne, Ind.

SEATS, TOILET, COMPOSITION
Fibre Mfg. Co., Boston.

SHOWERS
Coyne & Delany Co., Brooklyn.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Haines, Jones & Cadbury Co., Philadelphia.
Hoffmann & Billings Mfg. Co., Milwaukee.
Hudson Brass Works, Brooklyn.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Mueller Co., Decatur, Ill.
Speakman Co., Wilmington, Del.
Street & Kent Mfg. Co., Chicago, Ill.
Wolverine Brass Works, Grand Rapids, Mich.

PABST

Your men will appreciate Pabst Nipples. Made of brand new Pipe, carefully gauged for accuracy, reamed and chamfered, they turn in quickly and smoothly and seal with absolute tightness.

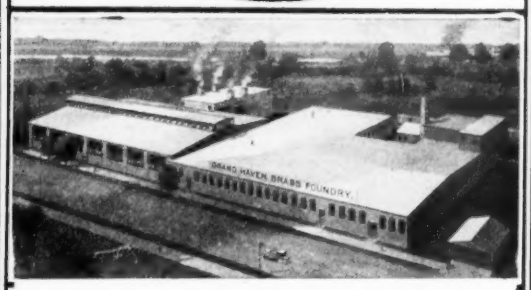
Yet, notwithstanding their advantages, they cost no more than the ordinary kind.

Ask your jobber

Fred Pabst Co., Mfrs.
917 Chestnut St. Milwaukee, Wis.

NIPPLES

Hinges of the Better Kind



GRAND HAVEN BRASS FOUNDRY
Grand Haven, Michigan
Hinges for all types of toilet seats

It Does the Work

Any vapor, vacuum, atmospheric or modulation system can be improved by equipping it with the

ThermoSyphonTrap

It returns condensation to boiler as fast as it forms, regardless of pressure or vacuum.

There are many other uses for this trap. Bulletin No. 16 explains it fully. Write for it.

Lytton Mfg. Corp. TRAP SPECIALISTS Franklin, Va.

Cast Brass Traps

We are Headquarters

ALL STYLES
ALL GAUGES
American QUALITY

We Sell Jobbers Only

American Sanitary Mfg. Co.
Abingdon, Illinois

"A Complete Line of Staple Brass Goods"

The New Flush Valve

Pilot 5-7

THE best features of two valve types—diaphragm and self-cleansing, equalizing port—combined in this new 5-7 Pilot Flush Valve. Double action! Double life! Double value! Three other PLUS FEATURES—easily adjustable water saver, removable seat and a very accessible compression shutoff.

Write for Commonsense Book on Valves

Hedges & Brother
103 SOUTH ST., NEWARK, N. J.

"I&M" No. 203
Basin Connection

Another Time Saver.

The Ideal connection from Basin Cock to Iron Pipe.

It saves one joint and a reducing coupling.

The threaded brass washer holds the supply pipe in place while making connection.

Note the long thread for plenty of adjustment.

Write for full particulars.

The Ireland & Matthews Mfg. Co.
Detroit, Mich.

Buyers' Directory

SHOWERS, THERMOSTATIC
Leonard-Rooke, Inc., Providence, R. I.

SINKS, ACID PROOF
Duriron Co., Inc., Dayton, O.

SINKS, ENAMELED IRON
Crane Co., Chicago.
Jones Hollow Ware Co., Baltimore.
Kohler Co., Kohler, Wis.
Rundle Mfg. Co., Milwaukee.
Standard San. Mfg. Co., Pittsburgh.
U.S. Sanitary Mfg. Co., Pittsburgh.

SINKS, PORCELAIN
Crane Co., Chicago.
Woodbridge Ceramic Corp., Woodbridge, N. J.

SINKS, SLOP
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Kohler Co., Kohler, Wis.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Company of America, Linfield, Pa.
Standard San. Mfg. Co., Pittsburgh.
U.S. Sanitary Mfg. Co., Pittsburgh

SINKS, STEEL
Koven & Bro., L. O., New York.

SINKS, VITREOUS CHINA
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Maddock's Sons Co., Thos., Trenton, N.J.
Standard San. Mfg. Co., Pittsburgh.

SLEEVES, FLOOR AND CEILING
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.

SOLDER
Du Bois Co., Inc., F. N., New York.
Raymond Lead Works, Chicago.
Eagle-Picher Lead Co., Cincinnati.

SOFTENERS, WATER
Duro Pump & Mfg. Co., Dayton, O.
Graver Corp., E. Chicago, Ind.
Monarch Eng. Co., Dayton.
Refinite Co., Omaha, Nebr.

SOLDERING FLUXES
Benson Co., Inc., Alex. R., Hudson, N.Y.
Northwestern Chemical Co., Marietta, O.

SOLVENTS, SEWER AND DRAIN PIPE
Blue Seal Chemical Co., Roselle, N.J.
Chamberlain Co., Pittsburgh.
Hercules Chemical Co., New York.
Rutland Fire Clay Co., Rutland, Vt.

SPRINKLER HEADS
C. S. B. Sprinkler Co., Boston.

STALLS, URINAL
Crane Co., Chicago.
Weis Mfg. Co., H., Atchison, Kan.

STANDS, PORTABLE, VISE
Crown Die & Tool Co., Chicago.
Martin & Sons, H. P., Owensboro, Ky.
Williams & Co., J. H., Brooklyn.

STANDS, RANGE BOILER
Eastern Fdy. Co., Boyertown, Pa.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Company of America, Linfield, Pa.
Wessels & Sons Co., D. D., Detroit.

STOCKS AND DIES
Armstrong Bros. Tool Co., Chicago.
Armstrong Mfg. Co., Bridgeport, Conn.
Bignall & Keeler Mch. Works, Edwardsville, Ill.
Borden Co., Warren, O.
Crown Die & Tool Co., Chicago.
Greenfield Tap & Die Corp., Greenfield, Mass.
Nye Tool & Mach. Works, Chicago.
Toledo Pipe Threading Machine Co., Toledo, Ohio.

SWITCHES, ELECTRIC PRESSURE
Penn Electric Machine Co., Des Moines, Ia.

TANKS, CLOSET, COMPOSITION
Coyne & Delany Co., Brooklyn.
Heap & Sons, Wm., Grand Haven, Mich.

TANKS, CLOSET, ENAMELED IRON
Crane Co., Chicago.
Jones Hollow Ware Co., Baltimore.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U.S. Sanitary Mfg. Co., Pittsburgh.

TANKS, CLOSET, VITREOUS CHINA
Chicago Pottery Co., Chicago.
Crane Co., Chicago.
Douglas Co., John, Cincinnati.
Maddock's Sons Co., Thomas, Trenton, N.J.
Standard San. Mfg. Co., Pittsburgh.
Zwermann Co., Robinson, Ill.

TANKS, CLOSET, WOOD
Bre Mfg. Co., Hyde Park, Mass.
Coyne & Delany Co., Brooklyn.
Olmstead-Thomson Mfg. Co., New Britain, Conn.
Standard Tank & Seat Co., Camden, N.J.
Van Arnam Mfg. Co., Ft. Wayne, Ind.

TANKS, EXPANSION
Detroit Range Boiler & Steel Barrel Co., Detroit.
Graver Corp., E. Chicago, Ind.
Koven & Bro., L. O., New York.
Novelty Steam Boiler Wks., Baltimore.
Penn Engineering Co., Philadelphia.
Riverside Boiler Works, Inc., Cambridge, Mass.
Trageser Steam Copper Works, John, New York.
Wheeling Steel Corporation, Wheeling, W.Va.

TANKS, PNEUMATIC
Graver Corp., E. Chicago, Ind.
Kewanee Boiler Co., Kewanee, Ill.
Leader-Trahern Co., Decatur, Ill.
Novelty Steam Boiler Works, Baltimore.
Richmond Engineering Co., Richmond, Va.
Wilks Mfg. Co., S. Chicago.
Wood Mfg. Co., John, Conshohocken, Pa.

The name "BELL"

Is the Sign of Good Washers

When you see "BELL" stamped on a washer, it means that it will stand up in service anywhere and everywhere.

The ONLY washer that will stand HOT as well as cold water.

Have you seen the new "BELL" Bev'eled Washer? If not, send for a sample.

The "BELL" Line of Hot Water Specialties also includes Fuller Balls, Steam Valve Discs and all kinds of small molded rubber goods.

Write for prices.

Estate of Andrew Bell 35 Commercial Street Newark, N. J.

There Is No Substitute for Quality

QUALITY is always worth its price, and the popular demand today is for better rather than cheaper merchandise. Cheap, competitive products are rarely satisfactory, even when new. And their failure to retain for even a limited time a satisfactory appearance or service qualities reflects badly upon the furnisher of that class of material.

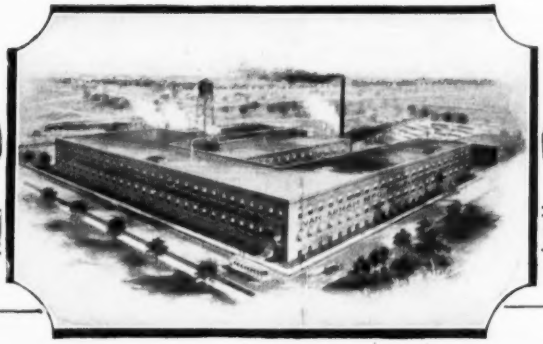
On the other hand, it is very often possible to obtain a very much higher quality by paying a comparatively slight difference in price, and this is particularly true when it comes to toilet seats.

VanArCo Toilet Seats, with all their advantages of selected materials, reinforced joint construction and five-coat finish, because of large scale production, modern machinery and standardized operations, cost very little more than the kind of seats you cannot afford to furnish.

The VanArCo line of Toilet Seats is a complete one. You'll find a model that will just meet the requirement of any installation. Ask your jobber to quote you.

Van Arnam Mfg. Co., Fort Wayne, Indiana

NONE BETTER VanArCo MADE



NONE BETTER VanArCo MADE

TO THE JOBBER AND PLUMBING CONTRACTOR — We are reproducing this advertisement as a display card and will be pleased to send you a copy upon request. *Riverside Boiler Works, Inc.*

Buyers' Directory

TANKS, SEPTIC
Chemical Toilet Corp., Syracuse.
Graver Corp., E. Chicago, Ind.
Kaustine Co., Inc., Buffalo, N.Y.
Richmond Engineering Co., Richmond, Va.

TANKS, STORAGE, STEEL
Caldwell Co., W. E., Louisville, Ky.
General Boilers Co., Waukegan, Ill.
Gerstein Bros. & Cooper, S. Boston.
Graver Corp., E. Chicago, Ind.
Kewanee Boiler Co., Kewanee, Ill.
Koven & Bro., L. O., New York.
Leader-Trahern Co., Decatur, Ill.
Novelty Steam Boiler Works, Baltimore.
Richmond Engineering Co., Richmond, Va.
Trageser Steam Copper Works, John, New York.
Wilks Mfg. Co., S. Chicago.
Wood Mfg. Co., John, Conshohocken, Pa.

TANKS, STORAGE, WOOD
Caldwell Co., W. E., Louisville, Ky.

THERMOSTATS
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Fulton Co., The, Knoxville, Tenn.
Honeywell Heating Specialties Co., Wabash, Indiana.
Hotstream Heater Co., Cleveland.
Minneapolis Heat Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Chicago.

THERMOSTATS, AUTOMATIC WATER HEATER
Sands Mfg. Co., Cleveland.

TOWERS, STEEL AND WOOD
Caldwell Co., W. E., Louisville, Ky.
Graver Corp., E. Chicago, Ind.

TRAPS, ACID PROOF
Duriron Co., Inc., Dayton, O.

TRAPS, ANTI-SIPHON
American Pin Co., Waterbury, Conn.
American Sanitary Manufacturing Co., Abingdon, Ill.
Eagle-Picher Lead Co., Cincinnati.
Frost Mfg. Co., Kenosha, Wis.
Ireland & Matthews Mfg. Co., Detroit.
Raymond Lead Works, Chicago.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Company of America, Linfield, Pa.
Street & Kent Mfg. Co., Chicago., Ill.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.

TRAPS, BACK WATER
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Crampton-Farley Brass Co., Kansas City, Mo.
Greenwood Mfg. Co., Detroit.
Josam Mfg. Co., The, Cleveland.
Illinois Malleable Iron Co., Chicago.
Wade Iron San. Mfg. Co., Chicago.

TRAPS, BRASS
American Pin Co., Waterbury, Conn.
American Sanitary Mfg. Company, Abingdon, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Central Brass Mfg. Co., Cleveland.
Frost Mfg. Co., Kenosha, Wis.
Haydenville Co., Haydenville, Mass.
Hilton Brass Foundry, Hilton, N. J.
Ireland & Matthews Mfg. Co., Detroit.
Wise, Inc., J. B., Watertown, N. Y.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

TRAPS, CAST IRON
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Eastern Fdy. Co., Boyertown, Pa.
Greenwood Mfg. Co., Detroit.
Josam Mfg. Co., The, Cleveland.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Riverside Fdry. & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.

TRAPS, CATCH BASIN
Crampton-Farley Brass Co., Kansas City, Mo.
Eastern Fdy. Co., Boyertown, Pa.
Estabrook's Sons, R., So. Boston.
Illinois Malleable Iron Co., Chicago.
Josam Mfg. Co., The, Cleveland.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Co. of America, Linfield, Pa.
Wade Iron San. Mfg. Co., Chicago.

TRAPS, DRUM
Blake Specialty Co., Rock Island, Ill.
Compound Inj. & Specialty Co., Chicago.
Eagle-Picher Lead Co., Cincinnati.
Eastern Fdy. Co., Boyertown, Pa.
Greenwood Mfg. Co., Detroit.
Raymond Lead Works, Chicago.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Riverside Foundry & Galv. Co., Kalamazoo, Mich.
Sanitary Company of America, Linfield, Pa.
Wade Iron San. Mfg. Co., Chicago.

TRAPS, GREASE
Compound Inj. & Specialty Co., Chicago.
Estabrook's Sons, R., So. Boston.
Koven & Bro., L. O., New York.
Raymond Lead Works, Chicago.
Street & Kent Mfg. Co., Chicago., Ill.
Wade Iron San. Mfg. Co., Chicago.

TRAPS, LEAD
Du Bois Co., Inc., F. N., New York.
Eagle-Picher Lead Co., Cincinnati.
Raymond Lead Works, Chicago.

TRAPS, RADIATOR AND STEAM
American District Steam Co., No. Tonawanda, N. Y.
Bishop & Babcock Co., Cleveland.
Crane Co., Chicago.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
Illinois Engineering Co., Chicago.
Johns-Manville, Inc., New York.
Lytton Mfg. Corp., Franklin, Va.
O-E Specialty Mfg. Co., Milwaukee.
Sterling Eng. Co., Milwaukee.

Cuts Installation Costs

The longer it takes your men to install any fitting, the shorter your net profits—unless you work on a cost plus basis, and that is not the rule these days.

Boosey's Seepage Urinal Drain can be installed with greater ease and in less time than any other, and it is never necessary to spring the stack.

Let us send you literature which tells the whole story

Greenwood Manufacturing Co.
5140 Hamilton Avenue, Detroit, Mich.

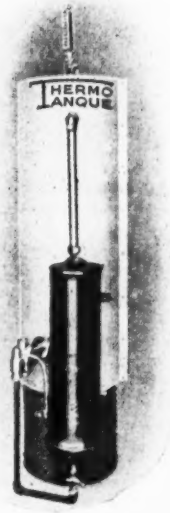
After the Installation—

Service Calls or Recommendations

The average purchaser of an automatic water heater doesn't know a great deal about them and depends upon you to sell him one that will give satisfactory service. If you do, he will recommend you to his friends—if you don't, he'll pester the life out of you. It pays to sell the

THERMO TANQUE

because it is high grade in material and unfailing and economical in operation. Moreover, it is easy to install—it comes to you all ready set up—just three connections and it's ready for immediate and continuous service.



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Goodman Automatic Water Heater Co.
523 ATLANTIC AVE. BROOKLYN, N. Y.

Domestic—Industrial and Swimming Pool

Water Filters

A standard size for every use.
Built complete in Our Own Plant.

Get Our Quotation on Your Jobs

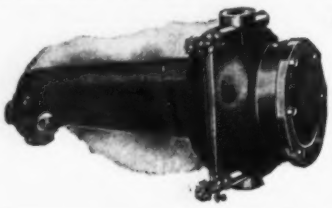
GRAVER *Corporation*
110 Todd Ave. East Chicago, Ind.

A Water Diet

to your house heating boiler will save you money if served through

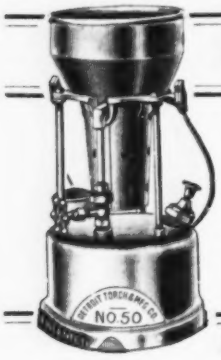
Nason Immersed Valve Feeder

Insures the boiler



Write Us

Nason Mfg. Company
71 Fulton Street
New York



No. 50

The Safety Pump

with the air opening above the gasoline line is another feature of the

DETROIT No. 50 FIRE POT

Used by 50% of all the plumbers in Detroit.

Write for Catalog G

Detroit Torch & Mfg. Co., Detroit, Mich.
New York Office: 45 Warren Street
Can. Rep. Geo. P. Fraser, 29 Temple Ave., Toronto

A High Grade Valve at a Moderate Price

We solicit your inquiries

Kinsey & Mahler Co.
Peoria Illinois

ORDER FROM

"HILTON"

With Confidence

QUALITY PRODUCTS at QUANTITY PRICES

Ask Your Jobber

Hilton Brass Foundry
Hilton, N. J.
New York Office:
Hudson Terminal Bldg.

Buyers' Directory

TRAPS, SAND
Eastern Fdy. Co., Boyertown, Pa.
Richmond Fdy. & Mfg. Co., Inc., Richmond, Va.
Sanitary Company of America, Linfield, Pa.

TRAPS, STEAM
Nason Mfg. Co., New York.

TRAPS, STEAM, RETURN
Bishop & Babcock Co., Cleveland.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
Illinois Engineering Co., Chicago.
Lytton Mfg. Corp., Franklin, Va.
O-E Specialty Mfg. Co., Milwaukee.
Sterling Eng. Co., Milwaukee, Wis.
Trane Co., La Crosse, Wis.

TRAPS, VACUUM
Bishop & Babcock Co., Cleveland.
Crane Co., Chicago.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
O-E Specialty Mfg. Co., Milwaukee.
Penberthy Injector Co., Detroit.
Sterling Eng. Co., Milwaukee, Wis.
Trane Co., La Crosse, Wis.

TRAYS, LAUNDRY
Chicago Granitine Mfg. Co., Chicago.
Douglas Co., John, Cincinnati.
Kohler Co., Kohler, Wis.
Standard San. Mfg. Co., Pittsburgh.
U.S. Sanitary Mfg. Co., Pittsburgh.
Wesely Co., Chas., Chicago.
Wessels & Sons Co., D. D., Detroit.

TRUCKS, MOTOR
Ford Motor Co., Detroit.

TUBES, SEAMLESS, BRASS COPPER, NICKEL
American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Metal Wks., Waterbury, Conn
Rome Brass & Copper Co., Rome, N.Y.

UNIONS, BRASS
Crane Co., Chicago.
McRae & Roberts Co., Detroit.
Walworth Mfg. Co., Boston.

UNIONS, IRON
Crane Co., Chicago.
Grabler Mfg. Co., Cleveland.
Illinois Malleable Iron Co., Chicago.
Walworth Mfg. Co., Boston.

URINALS
Crane Co., Chicago
Douglas Co., John, Cincinnati.
Imperial Brass Mfg. Co., Chicago.
Kohler Co., Kohler, Wis.
Maddock & Sons, John, Trenton.
Standard San. Mfg. Co., Pittsburgh.

VALVES, ACID PROOF
Duriron Co., Inc., Dayton, O.

VALVES, ANGLE, BRASS
American Radiator Co., Buffalo.
Capitol Brass Works, Detroit.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York City.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Scott Valve Mfg. Co., Detroit.
United States Radiator Corporation, Detroit.
Walworth Mfg. Co., Boston, Mass.

VALVES, BOILER FEEDER
Nason Mfg. Co., New York.

VALVES, FLUSH, WATER CLOSET, METER TYPE
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Douglas Co., John, Cincinnati.
Haas Co., Philip, Dayton, O.
Hedges & Bro., Newark, N. J.
Imperial Brass Mfg. Co., Chicago
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Sloan Valve Co., Chicago.

VALVES, FLUSHING, WATER CLOSET
Crane Co., Chicago.
Curtin Valve Co., A. F., Medford, Mass.
Frost Mfg. Co., Kenosha, Wis.
McShane Bell Fdy. Co., Baltimore.
Morency-Van Buren Mfg. Co., Sturgis, Mich.
Phoenix Brass Fdy., Irvington, N. J.
Republic Brass Co., Cleveland.
Wolverine Brass Works, Grand Rapids, Mich.
Woodward-Wanger Co., Philadelphia.

VALVES, GATE, BRASS
Capitol Brass Works, Detroit.
Central Brass Mfg. Co., Cleveland.
Commonwealth Brass Corp., Detroit.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Scott Valve Mfg. Co., Detroit.
Walworth Mfg. Co., Boston.

VALVES, GATE, IRON BODY
Crane Co., Chicago.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Scott Valve Mfg. Co., Detroit.
Walworth Mfg. Co., Boston.

VALVES, GLOBE, BRASS
American Radiator Co., Buffalo.
Central Brass Mfg. Co., Cleveland.
Commonwealth Brass Corp., Detroit.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Fulton Co., The, Knoxville, Tenn.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Ohio Brass Co., Mansfield, O.
Scott Valve Mfg. Co., Detroit.
United Brass Mfg. Co., Cleveland.
Walworth Mfg. Co., Boston.

VALVES, GLOBE, IRON BODY
Crane Co., Chicago.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Scott Valve Mfg. Co., Detroit.
Walworth Mfg. Co., Boston.

VALVES, PRESSURE REDUCING AND REGULATING
American District Steam Co., No. Tonawanda, N.Y.
Bishop & Babcock Co., Cleveland
Crane Co., Chicago.
Dunham Co., C. A., Chicago, Ill.
Fulton Co., The, Knoxville, Tenn.
Mueller Co., Decatur, Ill.

VALVES, PRESSURE RELIEF
Neptune Meter Co., New York.
Scott Valve Mfg. Co., Detroit.

VALVES, RADIATOR
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Capitol Brass Works, Detroit.
Commonwealth Brass Corp., Detroit.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Dole Valve Co., Chicago.
Dunham Co., C. A., Chicago.
Gorton & Lidgerwood Co., New York.
Hammond Brass Wks., Hammond, Ind.
Honeywell Heating Specialties Co., Wabash, Indiana.
Jenkins Bros., New York.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Kinsey & Mahler Co., Peoria, Ill.
O-E Specialty Mfg. Co., Milwaukee.
Ohio Brass Co., Mansfield, O.
Penn Engineering Co., Philadelphia.
Scott Valve Mfg. Co., Detroit.
Sherwood Brass Works, Detroit.
Sterling Eng. Co., Milwaukee.
Trane Co., La Crosse, Wis.
United States Radiator Corporation, Detroit.

VALVES, RADIATOR, AIR
American Radiator Co., New York.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Bishop & Babcock Co., Cleveland.
Crane Co., Chicago.
Dole Valve Co., Chicago.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
Jenkins Bros., New York.
O-E Specialty Mfg. Co., Milwaukee.
Penn Engineering Co., Philadelphia.
Sterling Eng. Co., Milwaukee.
Trane Co., La Crosse, Wis.
United States Radiator Corporation, Detroit.
Waterbury Mfg. Co., Waterbury, Conn.

Buyers' Directory

VALVES, RADIATOR, AIR, AUTOMATIC
American Radiator Co., New York.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Bishop & Babcock Co., Cleveland.
Dole Valve Co., Chicago.
Fulton Co., The, Knoxville, Tenn.
O-E Specialty Mfg. Co., Milwaukee.
Penn Engineering Co., Philadelphia.
Russell & Co., W. A., New York.
United States Radiator Corporation, Detroit.
Waterbury Mfg. Co., Waterbury, Conn.

VALVES, RADIATOR, GRADUATED, MODULATING
American District Steam Co., No. Tonawanda, N.Y.
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago.
Detroit Lubricator Co., Detroit.
Dole Valve Co., Chicago.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
Gorton & Lidgerwood Co., New York.
Illinois Engineering Co., Chicago.
O-E Specialty Mfg. Co., Milwaukee.
Ohio Brass Co., Mansfield, O.
Sterling Eng. Co., Milwaukee.
United States Radiator Corporation, Detroit.

VALVES, RADIATOR, PACKLESS
American Radiator Co., Buffalo.
Bishop & Babcock Co., Cleveland.
Commonwealth Brass Corp., Detroit, Mich.
Detroit Lubricator Co., Detroit.
Dole Valve Co., Chicago.
Dunham Co., C. A., Chicago.
Fulton Co., The, Knoxville, Tenn.
Gorton & Lidgerwood Co., New York.
Imperial Brass Mfg. Co., Chicago.
O-E Specialty Mfg. Co., Milwaukee.
Ohio Brass Co., Mansfield, O.
Sterling Eng. Co., Milwaukee, Wis.
United States Radiator Corporation, Detroit.

VALVES, STEAM
Bishop & Babcock Co., Cleveland.
Capitol Brass Works, Detroit.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago.
Dole Valve Co., Chicago.
Fulton Co., The, Knoxville, Tenn.
Haydenville Co., Haydenville, Mass.
Jenkins Bros., New York.
Johns-Manville, Inc., New York.
Kennedy Valve Mfg. Co., Elmira, N.Y.
Kinsey & Mahler Co., Peoria, Ill.
O-E Specialty Mfg. Co., Milwaukee.
Ohio Brass Co., Mansfield, O.
Penberthy Injector Co., Detroit.
Scott Valve Mfg. Co., Detroit.

VALVE-UNIONS
Nason Mfg. Co., New York.

VAPOR AND VACUUM HEATING SYSTEMS
American District Steam Co., No. Tonawanda, N. Y.
Bishop & Babcock Co., Cleveland.
Dunham Co., C. A., Chicago.
O-E Specialty Mfg. Co., Inc., Milwaukee.
Reading Heater & Supply Co., Reading, Pa.
Richardson & Boynton Co., New York.
Sterling Eng. Co., Milwaukee, Wis.
Trane Co., La Crosse, Wis.
Vapor Heating Co., York, Pa.

VISES, PIPE
Armstrong Bros., Tool Co., Chicago.
Armstrong Mfg. Co., Bridgeport, Conn.
Crown Die & Tool Co., Chicago.
Greenfield Tap & Die Corp., Greenfield, Mass.
Nye Tool & Mch. Works, Chicago.
Toledo Pipe Threading Machine Co., Toledo.
Williams & Co., J. H., Buffalo.

WASHERS
Bell, Andrew, Estate of, Newark.

WATER CLOSET COMBINATIONS
Universal Sanitary Mfg. Co., New Castle, Pa.
Zwermann Co., Robinson, Ill.

WATER CLOSETS, AUTOMATIC FLUSHING
Haas Co., Philip, Dayton, O.
Sherwood Brass Works, Detroit.
Standard San. Mfg. Co., Pittsburgh.
Vogel Co., Jos. A., Wilmington, Del.

WATER CLOSETS, FROST PROOF
Haas Co., Philip, Dayton, O.
Vogel Co., Jos. A., Wilmington, Del.

WATER SUPPLY SYSTEMS, PNEUMATIC
Bishop & Babcock Co., Cleveland.
Dayton Pump & Mfg. Co., Dayton, O.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Pump & Mfg. Co., Dayton, O.
Flint & Walling Mfg. Co., Kendallville, Ind.
Ft. Wayne Eng. & Mfg. Co., Ft. Wayne, Ind.
Goulds Mfg. Co., Seneca Falls, N. Y.
Leader-Trahern Co., Decatur, Ill.
Monarch Eng. Co., Dayton, O.
Myers & Bro. Co., F. E., Ashland, O.
National Waterlift Co., Kalamazoo, Mich.

WRENCHES, PIPE
Armstrong Mfg. Co., Bridgeport, Conn.
Brunswick-Kroeschell Co., Chicago.
Greenfield Tap & Die Corp., Greenfield, Mass.
Henry & Allen, Auburn, N.Y.
Walworth Mfg. Co., Boston.
Williams & Co., J. H., Buffalo.
Woodward-Wanger Co., Philadelphia.

WRENCHES, PIPE, CHAIN
Armstrong Bros., Tool Co., Chicago.
Brunswick-Kroeschell Co., Chicago.
Drop Forging Co. of New York, Jersey City, N.J.
Walworth Mfg. Co., Boston.
Williams & Co., J. H., Buffalo.

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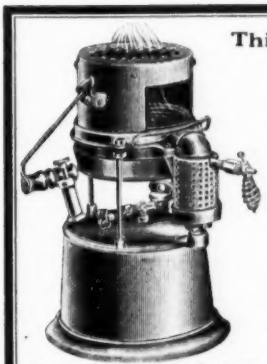

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